TECHNICAL REPORT

Hepatitis B and C testing strategies in healthcare and community settings in the EU/EEA

A systematic review

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A systematic review

This report was commissioned by the European Centre for Disease Prevention and Control (ECDC), coordinated by Andrew J Amato-Gauci, and written by Lauren Mason, Irene Veldhuijzen, Erika Duffell, Ayla van Ahee, Eveline Bunge, Lara Tavoschi and Andrew J Amato-Gauci.

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Contents

Figures

Tables

Abbreviations

AIDS	Acquired immune deficiency syndrome
Anti-HB	Antibody to hepatitis B surface antigen
Anti-HCV	Antibody to HCV
ART	Antiretroviral therapy
BBV	Blood-borne virus
CD4	Cluster of differentiation 4
CDC	Centers for Disease Control and Prevention
DBS	Dried blood spot
EASL	European Association for the Study of the Liver
GP	General practitioner
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HIV	Human immunodeficiency virus
IC	Indicator condition
MSM	Men who have sex with men
OST	Opioid substitution therapy
PLHIV	People living with HIV
PRISMA	Preferred reporting items for systematic reviews and meta-analyses
PWID	People who inject drugs
RCT	Randomised controlled trial
SIGN	Scottish Intercollegiate Guidelines Network
STI	Sexually transmitted infection
STROBE	Strengthening the reporting of observational studies in epidemiology statement
TB	Tuberculosis
TESSy	The European Surveillance System
UNAIDS	Joint United Nations Programme on HIV/AIDS
WHO	World Health Organization

Summary

An estimated nine million individuals are chronically infected with hepatitis B virus (HBV) and hepatitis C virus (HCV) across the European Union/European Economic Area (EU/EEA), many of whom are undiagnosed. We performed a systematic review to identify interventions effective at improving test offerings and uptake in the EU/EEA.

Original research articles were retrieved from PubMed and Embase databases in September 2017. Search strings combined terms for HBV/HCV, intervention, testing and geographic terms (EU/EEA). Retrieved publications were screened during a three-step selection process, in accordance with inclusion and exclusion criteria. A predefined set of variables was extracted from the included articles, and detailed summary tables were developed based on settings (i.e. healthcare versus community), testing intervention, and target population group. Outcomes of interest included test offerings, uptake, positivity rates, and patient and provider indicators of acceptability and feasibility. All included articles were assessed for quality.

Out of 8 331 records retrieved, 93 studies were selected, including 15 conference abstracts. Included studies reported on testing initiatives in primary healthcare facilities (9), hospitals (12), other healthcare settings (31) and community settings (41). Testing initiatives targeted different population groups, for example migrants, people who use drugs, people in prison, pregnant women, but also the general population. Implementation of novel HBV/HCV testing approaches was associated with increased testing uptake in a number of settings, including drug services, pharmacies, and STI clinics. Community-based testing services were effective in reaching populations at a higher risk for infection, vulnerable and hard-to-reach populations.

Our review identified several successful testing approaches in healthcare and community settings. Diversifying testing and offering a diverse set of testing opportunities (and making them part of the national testing strategy) may lead to a higher impact, both in terms of testing coverage and reduction of the undiagnosed fraction.

Introduction

In the European Union/European Economic Area (EU/EEA), an estimated 4.7 million people are chronically infected with hepatitis B virus (HBV); 3.9 million people are chronically infected with hepatitis C virus (HCV) [1]. HBV and HCV can both cause acute and chronic hepatitis, potentially leading to the development of cirrhosis, liver cancer or death of infected patients [2, 3]. Early disease and development of liver damage are often asymptomatic [4-6], meaning that HBV and HCV infection may go undetected for many years [7]. Many infected people remain undiagnosed [8].

Transmission of HBV and HCV can occur sexually, through blood-to-blood contact or vertically [mother to child]. Over the past decades, the pattern of hepatitis transmission changed in Europe. This is due to various factors, including improvements in blood transfusion and healthcare safety standards, HBV vaccination programmes, harm reduction programmes targeting injecting drug use, and significant changes in injecting drug use and immigration. However, a number of population groups are still potentially at high risk or have a high burden of HBV/HCV in EU/EEA countries, including people who inject drugs (PWID), men who have sex with men (MSM), people living with HIV (PLHIV), people in prison, and migrants from countries of high endemicity [9-11].

As highly effective treatment and prevention options are now available for HBV and HCV, including effective vaccines against HBV [12, 13], it is crucial that an appropriate public health response is in place to ensure that those infected are diagnosed and treated. To this end, testing programmes must be scaled up in order to reduce the undiagnosed fraction. The WHO has formulated an action plan to eliminate viral hepatitis as a public health threat in the European Region by 2030, setting targets of 50% of people with chronic infection diagnosed by 2020 and 90% by 2030 [14].

Testing can occur through a number of methods and in various settings, depending on the population group targeted and the local epidemiology and healthcare infrastructure. Testing in healthcare may take place across a range of different settings: in primary healthcare facilities and hospitals as well as other healthcare settings such as sexually transmitted infection (STI) clinics, antenatal services, and pharmacies. Outside of formal healthcare facilities, settings within the community, such as homeless shelters, migrant services and community-based drugs services can offer testing services which are adapted, targeted and made accessible to the populations that frequent them [15]. Outreach testing, for example using mobile units, street outreach by community health workers, or satellite services based at other agencies can be used to reach people who are not in contact with other health services [16]. Common testing strategies for hepatitis B and C include universal screening, birth cohort testing or testing targeted towards those at increased risk. In recent years, new technologies such as self-testing kits, and strategies for testing implementation have been developed, which may be considered for incorporation in countries' national testing policies and programmes. Evidence on which interventions are effective

at improving testing uptake and yield high positivity rates could help inform countries in deciding which strategic approaches to incorporate in national testing programmes.

The scope of this project was to provide an overview of different effective testing strategies for hepatitis B and C and their outcomes in the EU/EEA, covering all relevant population groups and settings. A systematic review was performed to collect, synthesise and analyse available data on HBV/HCV testing outcomes and acceptability measures from EU/EEA countries.

This study was conducted as part of a larger project to develop an integrated European testing guidance for HBV, HCV and HIV, coordinated by the European Centre for Disease Prevention and Control.

Methods

Search strategy and selection criteria

Original research articles were retrieved from PubMed and Embase databases on 1 September 2017. PICO questions were formulated (Annex). Search strategies combined controlled (MeSH/Emtree terms) and natural vocabulary on terms for HBV and HCV with terms for intervention and testing and geographic terms (EU/EEA) (Annex). The search strategy also included terms for linkage to care; for the purposes of this article, only methods and results applying to approaches to improve testing uptake are presented. Only studies published between 1 January 2008 and 1 September 2017 were included in the search. Articles in all EU/EEA languages were included.

Only articles reporting data from EU/EEA countries were included. Included publications described approaches to improve testing uptake and reported any of the following outcomes of interest: offer of test, testing uptake and coverage, positivity rate, acceptability and feasibility outcomes. Studies on unlinked anonymous testing to determine prevalence and studies describing the sensitivity/specificity of laboratory tests were excluded. The full inclusion and exclusion criteria are listed in Table A-3. Only original research articles (i.e. not reviews) and conference abstracts were included in this review; however, the reference lists from relevant systematic reviews retrieved in the literature search were checked manually for additional original articles not captured by the literature search. Conference abstracts from the International Liver Congress retrieved in the systematic literature search, reporting relevant quantitative data and published since 2015, were included as grey literature. Additional publications captured were subject to the same inclusion and exclusion criteria as listed above.

Two reviewers independently reviewed titles and abstracts of retrieved publications. Initially, a random sample of 5% was screened in duplicate, the results were then compared and used to refine the inclusion and exclusion criteria. Further rounds of duplicate reviews were conducted until a level of concordance of more than 95% was achieved, after which the remaining publications were divided between reviewers and screening continued independently in EndNote. The full texts of selected articles were subsequently screened by two reviewers. Of these articles, a random sample of 20% was screened in duplicate, and these reached more than 95% concordance. The remaining 80% of publications were divided between the reviewers and screened independently. Articles were included if there was uncertainty about inclusion or exclusion if this was not resolved after discussion between the reviewers.

Definitions

Primary healthcare was defined as healthcare provided by general practitioners. Hospital settings included all hospital departments, including inpatients, outpatients, medical admissions units and infectious disease units. Other healthcare settings included any formal healthcare settings outside of primary healthcare or hospital departments, for example STI clinics, pharmacies and prisons. Community-based testing was defined as any programme or service offering HBV/HCV testing outside of formal health facilities. Drugs services were defined as services offering prevention, support, detox and treatment for addiction to drugs or alcohol, either embedded in healthcare settings or set in the community. Outreach activities were defined as testing activities taking place in the community without a fixed-site facility, including mobile units or vans, street outreach by community health workers, and regular satellite services based at other agencies.

Testing uptake and coverage were defined as the percentage of people targeted by a testing programme that received testing. Positivity rate was defined as the percentage of people testing positive for HBsAg and anti-HCV for HBV and HCV respectively. When other markers were reported instead, these data were extracted and the marker was specified in tables.

Data extraction and quality assessment

Relevant data were extracted from included articles and recorded in a data extraction file (Microsoft Excel). A predefined set of variables covering study characteristics, study population details and outcomes was extracted

per study. The complete list of variables is provided in Table A-5. The unit for data extraction was study, not article. A study is defined as a report of data on a testing approach or linkage-to-care approach for HBV or HCV, in a defined country, over a discrete period of time. Therefore, one article may contain more than one study. If a study was captured by two different articles, the study was extracted once and the article with the most detail used as a reference.

The quality of included peer-reviewed literature was assessed using checklists developed by the Scottish Intercollegiate Guidelines Network (SIGN) [17] that include the most important criteria on publication quality from the PRISMA and STROBE guidelines. Using these checklists, an overall quality score was assigned per study: high (++), acceptable (+) and low (-). As some of the included publications concerned study designs for which no checklists exist, a list (provided in Table A-6) was compiled of relevant aspects from standard checklists, regarding the level of detail and clarity of the study, appropriateness of study population, data collection and denominator and the representativeness of the sample, which were answered with yes or no per study. Using the checklist, it was not possible to calculate an overall quality score for these studies, therefore, all relevant articles were included regardless of their quality, but the results of the assessment were taken into consideration in interpreting the results. Articles were excluded, however, when the methods and/or results provided an insufficient level of detail, making it impossible to accurately extract data. No quality assessment was performed on included grey literature publications.

A set of detailed summary tables was developed per setting (Tables A-7–A-11), containing the following information: study reference, country, study period, study design, study population and specific setting, sample size, outcomes (test offering, coverage and positivity rate, acceptance rate and patient and provider indicators of acceptability and feasibility), critical appraisal and comments. Within each table, findings are ordered by virus, study population, country and year of publication.

Results

The literature search on testing and linkage to care interventions retrieved 8 331 unique publications, of which 370 were selected based on title and abstract and were assessed in full text for eligibility. Of these, 62 articles were retrieved that formed the evidence base for the effectiveness of testing initiatives and interventions (Figure 1). Reasons for exclusion of publications are listed in Table A-4. The included publications comprised 93 studies in total, each detailing an intervention designed to improve testing uptake of HBV or HCV in a certain setting. A total of 78 studies were from peer-reviewed publications, and 15 concerned conference abstracts. A formal quality assessment was performed for 19 peer-reviewed studies, the remainder had study designs which precluded this. Detailed information of each included study is provided in Tables A-7 through A-11.

Testing initiatives in primary healthcare settings

Nine studies that reported outcomes on testing initiatives performed in primary healthcare settings were retrieved (Table 1), of which seven reported on risk group testing initiatives targeting migrants, PWID or homeless people [18-22]; one study reported on a birth cohort testing initiative [23] and two on novel testing initiatives [21, 24]. The novel testing initiatives both concerned oral sampling for HCV testing; one offered testing to homeless people and the other to the general population [21, 24]. Two studies offered HBV/HCV testing to migrants in combination with testing for other infectious diseases, HIV and tuberculosis (TB) [19, 20]. Three studies were retrieved on initiatives involving education targeted to GPs; two studies were on campaigns targeting GPs and risk groups or the public [19, 25, 26].

HBV/HCV test offer rates, coverage and positivity rates, where reported, ranged widely between studies. The highest offer rate and coverage reported was 70% and 100%, respectively, in a study targeting migrants [19]. Very high positivity rates for HCV were reported in initiatives targeting PWID (70%) and homeless people (26%) [18, 21]. Two initiatives targeting migrants reported HBV and HCV positivity rates of 0% [19, 20].

One comparative study on HCV risk group testing in PWID reported a 24.8% testing coverage in GP practices exposed to the intervention, compared with 0.3% of PWID tested in comparable control practices [18]. In a comparative study on birth cohort testing for HCV testing in an area of high HCV prevalence and intravenous drug use, 72% of 30–54-year-olds were offered testing, compared with 0% in a control practice where birth cohort testing was not implemented [23]. In an additional comparative study, the number of tests performed almost doubled during a national testing programme which offered awareness-raising activities for GPs and those at higher risk [26]. Another comparative study found a significant increase in the number tested when a public awareness campaign was combined with additional educational brochures and training for GPs, which resulted in three times more people being tested, compared to a control group that was only exposed to the campaign (testing rates increased by 1.4 times) [25].

Two studies provided data on the acceptability and feasibility of testing in primary healthcare settings. Testing acceptance rates were 56.0% among PWID [18] and 70% among migrants [19]. Among PWID interviewed about a testing intervention, all responded positively about the acceptability of provider-initiated HCV testing. Staff viewed the intervention as an opportunity to facilitate identification and referral [18].

Testing initiatives in hospital settings

Twelve studies were identified on the effectiveness of testing initiatives and interventions in hospital settings [Table 2]. Of these, six reported on risk group testing targeting migrants and psychiatric patients [27-29]; one study was on an oral sampling initiative [24]. Two studies reported on universal testing initiatives in which opt-out testing for HBV, HCV and HIV was offered in emergency departments [30, 31]. In addition, three studies reported on campaigns targeted at patients or risk groups [26, 28, 31]; one study was on an educational intervention targeted at migrants [28]. Eight studies concerned initiatives that offered combined testing for HBV, HCV and HIV [27, 29-32].

Test offer rates, coverage and HBV/HCV positivity rates varied between the different studies. Test offer rates were high [83% and 100%] in testing initiatives targeted at migrants and psychiatric patients [27-29], but were not reported by other studies. Coverage was highest [88.4%] in a study reporting on a universal testing initiative conducted at a single emergency department [30]. A separate universal testing initiative, however, yielded a much lower overall coverage of 27%, although with variations among testing sites [31]. Positivity rates for HBV and HCV were higher in studies reporting on targeted testing initiatives (2.2%–7.8% for HBV and 0.3%–8.7% for HCV) than those aimed at the general population [27-29].

One comparative study reported on implementation of oral sampling for HCV testing between 2011 and 2014 [24]. Coverage increased from 9.1% to 22%, and positivity rates increased from 0.5% to 4.5%. In another comparative

study, a national programme involving awareness raising activities was associated with an increase in number of tests taken in hospitals from 10 536 tests before and 12 170 during the intervention [26].

Testing initiatives in other healthcare settings

Thirty-one studies were included relating to other healthcare settings (Table 3), which included antenatal services, clinics for people with no health insurance, drug services (embedded in health services), migrant clinics, pharmacies, prisons, public health clinics and STI clinics. Twenty-one studies reported on testing targeting risk groups including migrants, prisoners, drug users and MSM [33-48]. One study concerned a universal HCV testing initiative for pregnant women [35]. Fourteen studies described novel testing initiatives, including rapid testing, DBS (dried blood spot) sampling, oral sampling and FibroScan [24, 32-34, 37, 39, 41, 43, 44, 48-50]. Other initiatives included one educational intervention targeting drug service users, two campaigns targeted at the general population, one study describing implementation of guidelines at an STI clinic and two studies in which clinical decision-making tools were implemented [26, 49, 51-53]. Eleven studies reported on interventions in which HBV/HCV testing was implemented in combination with testing for other BBVs (blood-borne virus), STIs and/or TB, in various settings [24, 32, 33, 36, 41, 42, 45, 46, 53, 54].

Testing coverage during or after interventions were found to vary widely between and within settings, with the highest coverage levels reported by studies in migrant clinics (87% to 91.4%) [36, 40], clinics for people with no health insurance (71% to 98.2%) [32, 42] and public health clinics (90% and 98%) [38]. Some studies on novel testing initiatives yielded high coverage levels when DBS sampling or rapid tests were used (up to 98.2% for rapid testing and up to 97% for DBS) [32, 48, 50]. The highest positivity rates for both diseases were reported in studies targeting drug users or PWID (up to 48% anti-HBc positive for HBV and up to 61% for HCV) [33, 38, 39, 44, 46, 48]. No studies conducted in other healthcare settings reported rates on test offerings.

Eleven comparative studies reported on interventions in other healthcare settings. In pharmacies, HCV testing uptake was 30% among drug users receiving opioid substitution therapy (OST) when DBS testing was offered, compared with 13% in pharmacies which did not offer DBS. Furthermore, DBS testing uptake was 36% in pharmacies in which pharmacist-led care pathways were used, compared with 24% when conventional care pathways were used [43, 44]. One randomised controlled trial (RCT) found that offering DBS testing for HCV in drug clinics and prisons significantly increased uptake rates in intervention sites, with a 14.5% increase compared to control sites [37]; however, another RCT in which DBS testing for HCV was offered in prisons found an OR of 0.86 [95% CI: 0.71–1.06] for the effect of the intervention on testing rate [34]. Another comparative study reported a doubling in the number of tests performed in prisons and STI clinics during a national testing programme which involved awareness-raising activities [26]. Point-of-care rapid testing in clinics for people without healthcare coverage was found to significantly increase testing uptake to 98.2%, compared to standard serology testing performed elsewhere, which had 64.2% uptake [32]. One study tested household contacts of HBV-positive pregnant women through nurse-led at-home DBS testing; the study reported a significant increase in coverage in antenatal services (62% to 97%) if the intervention was implemented, compared with control sites where no increase could be observed in the same time frame [50]. Another comparative study compared universal and risk-based HCV screening for pregnant women in antenatal services and reported a positivity rate of 1.7% for universal screening compared with 1.3% for targeted screening; the difference was not significant [35]. Information sessions and peer education increased uptake from 7% to 20% in a drug clinic, although this difference was not significant [49]. Introduction of a clinic-specific guideline in an STI clinic led to an increase in coverage from 4.7% to 13.6% [52]. One comparative study reported on a clinical decision-making tool initiative which included computer-assisted self/personal interviewing vs. paper and pen interviews in STI clinics. Both HBV and HCV testing uptake were highest [24% and 9%, respectively] after computer-assisted personal interviewing [53].

Acceptability and feasibility of testing initiatives in other healthcare settings were reported by three studies [32, 43, 53]. One study on rapid DBS testing for HCV in pharmacies found that patients found the pharmacy a good place to be tested, but some patients were suspicious when offered testing due to previous experience of discrimination at pharmacies [43]. Among pharmacy staff, rapid DBS testing for HCV was found to be simple to perform. Rapid testing in a clinic for people with no health insurance was preferred over serological tests by 76% of the participants, with reasons including less stress with same-day results and more practical use. Half of the clinical staff said that rapid testing simplified their consultation [32]. A study that compared computer-assisted interviewing to paper-and-pen interviews in STI clinics found that computer-assisted interviewing encouraged the disclosure of sexual risk-taking behaviour [53].

Testing initiatives in community settings

Forty-one studies were retrieved that formed the evidence base for the effectiveness of testing initiatives and interventions in community settings. Results of initiatives performed in community settings are presented in Table 4. Results for all intervention types are presented first, stratified by setting type. Of the retrieved studies, 36 reported on risk group testing initiatives, including initiatives targeting drug users, PWID, homeless people,

migrants, MSM and underprivileged people [33, 48, 55-77]. A further 21 studies were retrieved on novel testing initiatives, including DBS sampling, oral sampling, FibroScan and self-sampling kits [26, 33, 48, 55, 57-59, 63, 64, 68, 69, 73, 75, 78, 79]. Evidence on seven educational initiatives targeting risk groups [65, 67, 76, 80], seven campaigns targeting risk groups, GPs or the public [26, 56, 65, 73, 74, 77], two national programmes [26, 60] and four communication and technology initiatives was also retrieved [66, 72, 77]. Community settings included fixed community-based testing sites, community-based drug services, online tools and outreach activities. Fifteen studies reported on integrated testing initiatives in which HBV/HCV testing was combined with testing for other BBVs, STIs and/or TB [33, 55, 57-59, 62, 64, 66, 67, 70, 71, 75, 76, 78].

Coverage rates above 80% were reported by two testing initiatives conducted in community drugs services [48, 55], although the other six studies conducted in this settings reported lower coverage. HCV positivity rates were high in this setting [26, 48, 60, 64, 69, 80]. Outreach testing activities and testing initiatives conducted in fixed community sites yielded coverage rates of up to 83.3% and 71.1%, respectively [56, 59, 62, 63, 65, 67, 68, 70, 71, 73-76, 78]. In general, online testing initiatives reported somewhat lower coverage rates relative to other settings (4.4% and 16.2%) [66, 77], as well as low positivity rates for HBV (0% and 0.2%). Across all settings, novel testing initiatives yielded relatively high coverage rates in general; eight out of fourteen studies reported coverage testing more than 50% of the targeted population [26, 33, 48, 55, 57-59, 63, 64, 68, 69, 73, 75, 78, 79].

Two comparative studies reported on novel testing initiatives targeted at risk groups. In community drug services, on-site oral sampling of drug users had a reported uptake rate of 100%, compared with 7.4% for standard serological testing carried out at an STI clinic [55]. Another study compared nurse-delivered outreach screening at a sauna and self-sampled DBS postal testing kits to standard screening at an STI clinic for MSM. The study reported uptake rates for the first 30 users of each service: 83.3% for outreach, 53.3% for DBS postal kits, and 100% for standard screening. Positivity rates were higher for outreach [4% had a cleared HBV or HCV infection] and DBS postal kits [25% had a cleared HBV or HCV infection], compared to 0% for those tested in STI clinics. In addition, almost all STI clinic users had been tested previously, compared with just over half of sauna and postal kit users [75].

An RCT compared outreach testing in shelters for underprivileged people, involving group education sessions and individual consultations during which subjects were offered testing, either at a health centre or on-site. Uptake was 42.8% at healthcare centres and 59.7% on-site. Testing uptake in a control group that received no intervention during the same time period was 1.5% [67]. Educational sessions for PWID attending harm reduction centres contributed to an increased testing uptake from 44% to 85%, compared to an increase of 51 to 78% in a control group that received no educational intervention [80]. During an HCV action plan in Scotland, implementation of DBS testing and awareness activities resulted in a threefold increase in HCV testing uptake in community drug services [RR 3.5, $p<0.001$] and a 12-fold increase in positive test results [RR=12.1, $p<0.001$]. In England, a national framework of activities to improve prevention, diagnosis and treatment of HCV led to an increase from 26% coverage in 2000 (prior to the national programme) to 62% coverage in 2008 [26, 60]. Lastly, a communication and technology HBV testing initiative involving internet-based recruitment of migrants for screening yielded testing uptake rates of 43.5%–46.0%, although comparison between different strategies (behavioural tailoring, behavioural plus cultural tailoring or generic information) showed no differences [72].

Eight studies provided data on the feasibility and acceptability of testing in community settings. Test acceptance rates ranged from 28.4% to 98.2% [58, 59, 77, 78], with the highest rates reported in two studies that described outreach initiatives targeting drug users, one of which used oral sampling [58, 59]. Another study reporting on an outreach testing initiative targeted at Chinese migrants reported that 100% of interviewed recipients found an information session prior to testing useful and just 5% responded that the test caused discomfort [73]. A study describing an oral sampling initiative at a homeless shelter reported that 91% of the participants would agree to screening or thought an oral swab test was an acceptable form of testing [68]. An online platform offering home sampling kits for HBV, HIV and STIs reported that of the samples returned, 15% provided insufficient blood and 39% of participants reported difficulties taking blood samples. However, 95% of the test users said they would use the online service again, and 93% would recommend it to family and friends [79]. A testing initiative targeted at university students with an acceptance rate of 37% reported that there was no indication or reports from students or staff that the testing offer and process were stigmatising or undesirable [78]. Lastly, a culturally targeted screening project involving campaigns and educational meetings for Turkish migrants was considered 'good' and 'understandable' by 97% of the participants [65].

Testing initiatives in multiple/unspecified settings

In addition, two studies were retrieved which provided data on initiatives conducted in multiple settings or did not specify results per setting. One study examined the outcomes of a national HCV prevention programme and reported that testing increased from 2000 to 2005 by 45% but decreased by 10% in 2006. Positivity rates decreased from 4.3% to 2.9% [81]. A further study describing a national testing programme which involved awareness-raising activities reported outcomes across all settings; 19 058 tests were taken before and 29 045 tests were taken during the programme, and positivity rates decreased from 9.6% to 6.8% [26].

Discussion

We undertook a comprehensive systematic review to collect, synthesise and analyse available data on HBV/HCV testing strategies across the EU/EEA. Available evidence on testing strategies were analysed qualitatively across primary healthcare, hospital settings, other healthcare settings and community settings.

Primary healthcare is usually the first point of contact that patients will have with the healthcare system. Therefore, it is an important setting for testing a number of population groups that may not present or may be more difficult to capture in other settings, and may be especially important for capturing specific population groups such as (former) PWID [82]. However, according to a UK study, of all HCV diagnostic tests performed in a pool of sentinel laboratories, only 16% were requested by GPs [83]. Overall, the evidence retrieved on the effectiveness of testing interventions to improve HBV and HCV testing coverage in primary healthcare was limited, restricted to a few EU/EEA countries, and focused mainly on targeted test offerings for risk groups such as migrants, PWID and the homeless. Test uptake and positivity rate varied between studies. A previous meta-analysis assessing the effectiveness of targeted HCV testing interventions found that they were effective in diagnosing cases and increasing uptake of treatment, particularly when strategies involved practitioners [84]. Limited evidence indicated that educational interventions targeting GPs and campaigns targeting the public, GPs or risk groups may have benefits – particularly when education and campaigns are combined – and that offering HCV testing in this setting was acceptable to patients.

Hospitals are another important location for testing, with more than half of all HCV tests performed in UK sentinel laboratories requested by hospital-based clinicians, especially hepatology and infectious disease departments [83]. However, the retrieved evidence on testing interventions aimed at improving HBV and HCV testing in hospital settings was relatively limited. In many studies, testing for HBV and HCV was performed as part of a BBV screening test that included HIV testing. Specialised hospital departments could be strategic settings to capture patients belonging to certain risk groups and encourage and facilitate testing. Targeted testing to individuals from risk groups (migrants and psychiatric patients) was implemented in hospital departments with generally high positivity rates and fairly high levels of testing uptake in studies involving hospital inpatients or outpatients attending the hospital for reasons other than testing, although uptake was lower when participants were invited to come to the hospital for the sole purpose of testing. Two studies reported on universal testing strategies in emergency departments; positivity rates were lower compared to other strategies. However, in both cases HCV positivity rates were higher than the national prevalence, probably because they were performed in urban areas with high injecting drug use/HIV prevalence. Both studies concluded that in such settings, universal testing in the emergency department could be an important strategy for case finding. Aside from the implementation of testing, a number of studies which investigated other strategies to improve testing coverage in hospitals, including education programmes and campaigns were identified. Limited evidence indicated that campaigns may contribute to improving testing rates.

Evidence was retrieved on testing initiatives implemented in a range of other healthcare settings. Although coverage and positivity rates were variable, these were often high when risk groups were targeted, indicating that offering testing to certain groups at locations they specifically attend for health purposes, such as health clinics catering to migrants, could be an effective method for case finding. Locations frequently visited by certain groups, where staff are medically trained, present an opportunity that can be exploited for testing. For example, individuals receiving OST (opioid substitution therapy) access pharmacies on a regular basis to receive medication. People receiving OST were found to be more likely to accept DBS testing at the pharmacy than testing from other providers [43]. Furthermore, pharmacies can provide treatment for those found to be infected, facilitating linkage to care [44]. Novel testing approaches such as rapid testing and DBS were frequently employed in testing initiatives in the various healthcare settings and were found to be effective in increasing uptake in a number of comparative settings, as well as being highly acceptable among users and testing staff. Rapid testing allows point-of-care testing, which simplifies the testing process because those tested do not have to visit outside testing centres or wait to pick up results. This was found to be more readily accepted than serological testing in external laboratories by individuals without health insurance seeking care in free clinics [32]. Another strategy identified that may help improve testing uptake in other healthcare settings included implementation of clinic-specific guidelines, which improved screening rates at one STI clinic [52]. These may be particularly useful in countries where national hepatitis testing guidelines are not available [8].

Community-based testing services, both fixed-site and outreach-based, represent potential sites to target-specific population groups and individuals who may be at increased risk of infection and who are not in contact with formal health services. Testing in community settings can be adapted and made accessible for these groups in order to maximise testing uptake [15].

A gap in policy on community and outreach testing was reported by some EU countries suggesting that this type of testing is not always implemented [8]. This review identified a large body of evidence that supports the implementation of community-based testing services. According to the evidence, testing services in community-

settings often resulted in high uptake rates and high positivity rates, although influenced by the underlying epidemiology. Available evidence supported outreach testing services as these resulted in generally high uptake and high positivity rates when targeting MSM, people with migration background and drug users. Outreach activities included short-term testing facilities, mobile testing services and street-based outreach and were often combined with information sessions at locations frequented by target groups. A limited body of evidence supported testing services in community-based drug services; often high uptake and positivity rates were achieved in interventions performed in this setting. Available evidence also suggested that use of oral sampling and DBS increase testing uptake and oral sampling was considered to be acceptable in community-based services. DBS and rapid tests are recommended by WHO to facilitate testing in settings where no laboratory is available [85]. Educational interventions, campaigns and national programmes may also help to increase community-based testing uptake for HBV and HCV. An earlier systematic review on chronic HBV testing in community settings identified common features of successful screening interventions that included strategies to increase community awareness and knowledge, were able to achieve community engagement, incorporated the target population's values in the design and implementation of the programme and were able to provide low cost or free access to care [86].

Limited evidence was retrieved on a number of testing modalities that may apply to a range of settings. Contact tracing and partner notification of STIs including HBV/HCV has recognised public health benefits, such as controlling the spread, reducing morbidity and mortality, reaching people with asymptomatic infection, and people who do not present for diagnosis, counselling and treatment [87]. Evidence from one study retrieved in the systematic review found that nurse-led home-delivered DBS testing improved test uptake among contacts of HBV-positive pregnant women [50]. Another study concerned a birth cohort testing initiative. In the case of HCV testing for 30–54-year-old patients of a general practice in an area of high HCV prevalence and intravenous drug use, it was concluded that a more targeted approach targeting (former) PWID would be more efficient in this specific setting [23]. However, a recent WHO guideline recommended that HCV screening in birth cohorts of older persons at higher risk of infection and morbidity may be applied in populations with overall lower general prevalence, where indicated by the local epidemiology [85, 88]. Recent epidemiological studies to assess the relevance of such an approach have been performed in some EU/EEA countries, demonstrating the growing interest in this testing strategy [89-91]. Self-sampling and self-testing are relatively new testing modalities that have the potential to increase testing coverage. For HIV, use of self-sampling or self-testing kits is already authorised in a limited number of countries [92]. Two studies retrieved in the systematic review offered self-sampling kits, either during outreach activities [75] or via an online platform [79]. In both studies, around 50% of tests were returned and one study found self-sampling to be highly acceptable [79]. No evidence on self-testing for HBV/HCV was identified by the systematic review. This may reflect the lack of technology availability for HBV/HCV self-testing, however, as these technologies become available in the future, self-testing may become a potentially important approach to expand access to testing [93]. For HIV, self-testing has been associated with increased testing uptake among men in a number of RCTs and is recommended as a testing approach by WHO [94].

Barriers to testing exist at individual, healthcare provider and institutional levels, which can impede case-finding efforts. In general, the asymptomatic course of HBV/HCV, low levels of knowledge and awareness and fear of stigma and discrimination may prevent people from seeking testing or accepting test offer [20, 43, 95-100]. For vulnerable populations, health and social problems, unstable or unstructured lives and poverty can be barriers, for PWID venous access can be an issue. For people with a migration background, culture, faith, language and their perceptions and understanding of the healthcare system may present barriers to testing [18, 43, 97-99, 101]. The proximity of healthcare services to individuals, low awareness among healthcare professionals and forgetting to test, are barriers that may exist at the level of the testing provider [43, 97, 101]. Barriers specific to healthcare include administrational limitations, time limitations and the GP's relationship with their patients [18, 20, 101]. Potential barriers specific to community include inconvenient testing facilities and lack of advocacy and promotion [97, 100]. At an institutional level, pressures, capacity and funding shortages in primary healthcare sectors and community organisations can present barriers to testing [97, 98]. Implementing certain testing strategies may help to alleviate many of these barriers; for example, educational initiatives, campaigns and other health promotional activities could help to raise awareness and knowledge within certain populations, the wider public and healthcare professionals. Using novel techniques such as DBS or oral sampling can bypass any issues with venous access. Demedicalising services and bringing them out into the community could circumvent barriers which exist within healthcare settings. Implementing testing activities in a range of settings could lessen the impact of setting-specific barriers.

The comparability of data retrieved in the systematic review was limited by the large degree of heterogeneity between studies in the outcomes measured, the specific populations targeted, recruitment and length of interventions, and whether testing initiatives were combined with health promotional activities; all of which could influence the success of the intervention. In addition, the lack of a threshold for sufficient levels of testing uptake or coverage precluded quantitative analysis. The majority of studies did not use a comparator to assess effectiveness of interventions. Furthermore, none of the studies retrieved measured long-term outcomes of interventions such as impact on prevalence and incidence over time. These factors make it difficult to draw firm conclusions as to which interventions are the most effective in each setting.

Few studies were deemed to be of high quality, and the majority had a study design which precluded formal quality assessment. For these studies, the most common quality issues noted were a lack of clarity or detail in methodology (e.g. data collection methods), limited description of the study population and unclear or inappropriate denominator. A significant proportion [16%] of the evidence base of the review was from included conference abstracts, i.e. non-peer-reviewed literature for which methods and results were often extremely limited and quality assessment was not possible.

In conclusion, evidence was retrieved for successful testing approaches applied in primary healthcare, hospital and other healthcare settings and community settings, although within most settings data were fairly limited. Testing approaches targeting population groups at high risk of HBV/HCV were found to be viable in various settings, and there was evidence that other interventions such as awareness campaigns and education may improve uptake by helping to overcome some of the barriers to testing. DBS was also associated with increased testing uptake in a number of different settings. Other HBV/HCV testing strategies for which limited evidence was found, but may still be considered, are contact tracing, home sampling and birth cohort testing for HCV. Further research on testing strategies is needed to gain a clearer overview of which initiatives are the most successful in improving testing uptake and yielding high positivity rates in each setting.

Diversifying test offerings and combining a diverse set of testing opportunities within national testing strategies may lead to higher impact in both in terms of testing coverage and reduction of the undiagnosed fraction.

Elimination of viral hepatitis in Europe by 2030, in accordance with the WHO regional goal, will require diagnosing those infected and ensuring linkage to appropriate prevention, care, treatment and support services [14, 85]. Implementation of effective, evidence-based testing strategies, particularly among vulnerable and hard-to-reach populations is a vital step in realising this goal.

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Annex 1. Results: figures and tables

Figure 1. PRISMA flow diagram

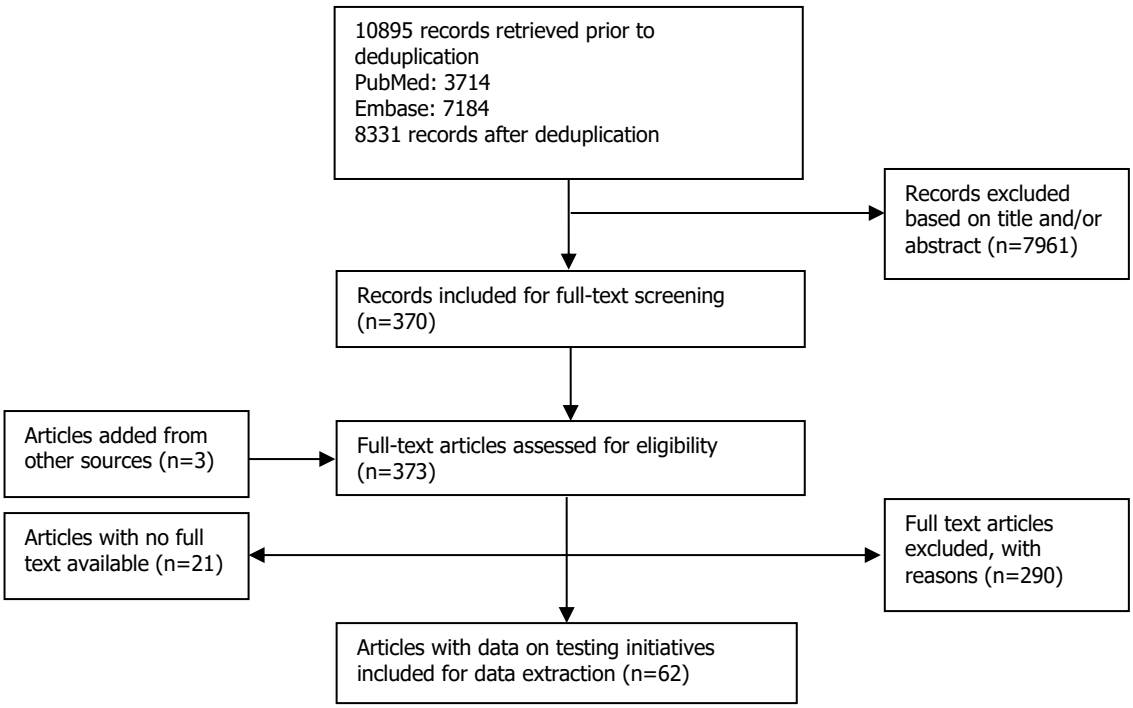

Table 1. Evidence base for the effectiveness of testing initiatives in primary healthcare settings

Intervention	Studies included; quality of evidence	Target population	Test offer	Coverage/number of tests/tested*	Positivity rate
Risk group testing	HBV				
	N=3 studies [1-3] Quality: 3 studies NA	Migrants (n=3) (Sample size: 47-560[a])	100%	Number tested/tests: 2,223 Coverage: 2.3% and 70%	0%-6.7%
	HCV				
	N=4 studies [1, 2, 4, 5] Quality: 1 study low 3 studies NA	PWID (n=1) (Sample size: intervention 485, control NR)	52% intervention	Coverage: 24.8% intervention, 0.3% control	Comparative study: 70% intervention, 22% control
		Homeless (n=1) (Sample size: NR)		Number tested/tests: 460	26% 9.6% newly diagnosed
		Migrants (n=2) (Sample size: 47 and 560)	100%	Coverage: 2.3% and 70%	0%
Birth cohort testing	HCV				
	N=1 study [6] Quality: Acceptable	30-54 year olds (n=1) (Sample size: Intervention 584, control NR)	Comparative study:72% intervention; 0% control	Comparative study: Coverage: 20% intervention; 0% control	Comparative study: 13% intervention; NA control
Novel testing	HCV				
	N=2 studies [5, 7] Quality: 2 studies NA	General pop (n=1) (Sample size: 600 – 29,600)		Coverage (oral): 9.1% - 22%	0.4% - 4.5%
		Homeless (n=1) (Sample size: NR)		Number tested/tests (oral): 460	26% 9.6% newly diagnosed
Education	HBV				
	N=1 study [1] Quality: NA	Targeted at GPs Migrants (n=1) (Sample size: 47)	100%	Coverage: 70%	0%
	HCV				
	N=2 studies [1, 8] Quality: 1 study low 1 study NA	Targeted at GPs Migrants (n=1); General pop. (n=1) (Sample size: 47[a])	100%	Coverage: 70% Comparative study: Number tested: Campaign + Education (intervention): 57 tests before; 172 during; Campaign (control): 86 tests before; 118 during OR of the increase intervention vs control: 2.2 (95% CI 1.5-3.3)	0% Comparative study: Campaign + Education (intervention): 0% before; 1.7% during; Campaign (control): 1.7% before; 0.8% during
Campaign	HCV				
	N=2 studies [8, 9] Quality: 1 study low 1 study NA	Targeted at public General pop. (n=1) (no sample)		Comparative study: Number tested/tests: Campaign + Education (intervention): 57 tests before; 172 during; Campaign (control): 86 tests before; 118 during OR of the increase intervention vs control: 2.2 (95% CI 1.5-3.3)	Comparative study HCV: Campaign + Education (intervention): 0% before; 1.7% during; Campaign (control): 1.7% before; 0.8% during
		Targeted at GPs/risk groups General pop. (n=1) (no sample)		Comparative study: Number HCV tested/tests: before 5,421 tests; during 10,117 tests	Comparative study HCV: before 9.6%; during 6.8%

[a] Denominator not reported for all studies.
** Number of tests is only reported here if no data on coverage is available*
HBV: hepatitis B virus; HCV: hepatitis C virus; HIV: human immunodeficiency virus; NA: not applicable; NR: not reported; oral: oral sampling; PWID: people who inject drugs; TB: tuberculosis

Table 2. Evidence base for the effectiveness of testing initiatives in hospital settings

Intervention	Studies included	Setting; target population	Test offer	Coverage/number of tests/tested*	Positivity rate
Risk group testing	HBV				
	N=3 studies [10-12] Quality: 3 studies NA	Other hospital departments (n=3) (Sample size: 105-3,226) Migrants (n=2); Psychiatric patients (n=1)	Migrants: 100% Psychiatric patients: 83%	Coverage migrants: 28.7% and 61% Coverage psychiatric patients: 54%	Migrants: 2.2% and 7.8% Psychiatric patients: 7.0%
	HCV				
	N=3 studies [10-12] Quality: 3 studies NA	Other hospital departments (n=3) (Sample size: 105-3,226) Migrants (n=2); Psychiatric patients (n=1)	Migrants: 100% Psychiatric patients: 83%	Coverage migrants: 28.7% and 61% Coverage psychiatric patients: 54%	Migrants: 0.3% and 3.6% Psychiatric patients: 8.7%
Universal testing	HBV				
	N=2 studies [13, 14] Quality: 2 studies NA	ED only (n=2) (sample size: 7,807 and 10,000) General population (n=2)		Coverage: 27% and 88.4%	0.5% and 0.7% 0.2% and 0.5% newly diagnosed

Intervention	Studies included	Setting; target population	Test offer	Coverage/number of tests/tested*	Positivity rate
	HCV				
	N=2 studies [13, 14] Quality: 2 studies NA	ED only (n=2) (sample size: 7,807 and 10,000) General population (n=2)		Coverage: 27% and 88.4%	1.8% and 5% 0.6% and 0.7% newly diagnosed
Novel testing	HCV				
	N=1 study [7] Quality: NA	Other hospital departments (n=1 (sample size: 600 - 29,600) General population (n=1)		Comparative study: coverage (oral): 9.1% (2011) 14% (2012) 16.9% (2013) 22% (2014)	Comparative study: 0.5% (2011) 0.5% (2011) 0.4% (2013) 4.5% (2014)
Education	HBV				
	N=1 study [10] Quality: NA	Targeted at migrants Migrants (n=1) (sample size: 3,226)	100%	Coverage: 28.7%	2.2%
	HCV				
	N=1 study [10] Quality: NA	Targeted at migrants Migrants (n=1) (sample size: 3,226)	100%	Coverage: 28.7%	0.3%
Campaign	HBV				
	N=2 studies [10, 14] Quality: 3 studies NA	Targeted at patients General pop. (n=1) (sample size: 7,807)		Coverage: 27%	0.7% 0.5% newly diagnosed
		Targeted at risk groups Migrants (n=1) (sample size: 3,226)	100%	Coverage: 28.7%	2.2%
	HCV				
	N=3 studies [9, 10, 14] Quality: 3 studies NA	Targeted at patients General pop. (n=1) (sample size: 7,807)		Coverage: 27%	1.8% 0.7% newly diagnosed
		Targeted at risk groups General pop. (n=1) (sample size: NR) Migrants (n=1) (sample size: 3,226)	100%	Comparative study: before 10,536 tests; during 12,170 Coverage: 28.7%	Comparative study: 9.9% before; 7.9% during 0.3%

[a] Denominator not reported for all studies.
[*] Number of tests is only reported here if no data on coverage is available
ED: emergency department; HBV: hepatitis B virus; HCV: hepatitis C virus; HIV: human immunodeficiency virus; NA: not applicable; NR: not reported; oral: oral sampling

Table 3. Evidence base for the effectiveness of testing initiatives in other healthcare settings

Intervention	Studies included	Setting/target population	Coverage/number of tests/tested*	Positivity rate
Risk group testing	HBV			
	N=6 studies [15-20] Quality: 6 studies NA	Migrant clinic (n=2) (sample size: 516 and 4078)	Coverage: 87% and 91.4%	6.0% and 7.7%
		Prisons (n=2) (sample size: 3,468[a])	Number tested: 160 Coverage: 65.3%	0% and 4.4% 1.5% newly diagnosed
		Drug services (n=1) (sample size: 287 and 2,024)	Coverage: 34% and 69%	33% and 48% (anti-HBc)
		Clinic for people with no health insurance (n=1) (sample size: NR)	Coverage: 90% when screening is proposed during a prevention interview; 71% without interview	6.9%
	HCV			
	N=15 studies [15, 17-30] Quality: 3 studies acceptable 1 study low 11 studies NA	STI clinics (n=1) (sample size: 3,365) MSM (n=1)	Coverage: 69%	0.65%
		Prisons (n=3) (sample size: 3468 – 3600[a])	Number tested: 160 Coverage: 64.6% Comparative study (DBS): ORs for effect of the intervention on testing rate: OR: 0.86; 95% CI: 0.71-1.06; P=0.153	22.8% and 33.8% 1.5% newly diagnosed
		Drug services (n=3) (sample size: 287 - 2,566)	Coverage: 53%-84.2%	26% - 61%
		Antenatal services (n=1) (sample size: 4369)	28.3% received targeted screening	Comparative study: 1.3% (compared to 1.7% universal screening; difference between the two NS)
		Migrant clinic (n=1) (sample size: 4078)	Coverage: 90.8%	3.6%
		Pharmacies (n=2) (sample size: 143 intervention, 561control; 244 conventional care pathway; 262 pharmacist care pathway)	Comparative study (DBS): 30% intervention; 13% control. OR: 2.25 (95% CI 1.48 - 3.42) Comparative study: 24% coverage conventional care pathway; 36% pharmacist care pathway	Comparative study: 25.9% conventional care pathway 26.5%; pharmacist care pathway

Intervention	Studies included	Setting/target population	Coverage/number of tests/tested*	Positivity rate
		Drug clinics and prisons (n=1) (sample size: 6,550 intervention, 5,800 control)	Comparative study coverage (DBS) intervention: 8.4% before, 20.6% during intervention control: 7.7% before, 5.4% during intervention	32% (overall)
		Public health clinic (n=1) (sample size: 81 and 497)	Coverage: 90% and 98%	60% (overall)
		Specialist services[b] (n=1) (sample size: 1,322)		55%
		Clinic for people with no health insurance (n=1) (sample size: NR)	Number tested/tests: 1,196 Coverage: 90% when screening is proposed during a prevention interview; 71% without interview	5.8%
Universal testing	HCV			
	N=1 study [22] Quality: NA	Antenatal services (n=1) (No sample size)	Number tested: 4,222	Comparative study: 1.7% (compared to 1.3% targeted screening; difference between the two NS)
Novel testing	HBV			
	N=3 studies [17, 31, 32] Quality: 1 study high 1 study acceptable 1 study NA	Clinic for people with no health insurance (n=1) (sample size: 162 intervention, 162 control)	Coverage: 64.2% (serology); 98.2% (RT)	Comparative study: 9.6% (serology); 8.1% (RT)
		Antenatal services (n=1) (Sample size: 41 pre-intervention; 58 post-intervention; 91 pre-control; 68 post-control)	Comparative study: Coverage (DBS): 62% pre-intervention; 97% post-intervention; 40% pre-control; 39% post-control	Comparative study: 0-3% pre-intervention; 3-22% post-intervention; 6-8% pre-control; 2-9% post-control
		Prisons (n=1) (sample size: NR)	Number tested (DBS): 160	0%
	HCV			
	N=11 studies [7, 17, 21, 23, 25, 27-31, 33] Quality: 1 study high 4 studies acceptable 1 study low 5 studies NA	Clinic for people with no health insurance (n=1) (sample size: 162 intervention, 162 control)	Coverage: 64.2% (serology); 98.2% (RT)	Comparative study: 3.8% (serology); 2.5% (RT)
		Drug services (n=3) (sample size: 25-1,123)	Number tested/tests (DBS): 266 Coverage (FibroScan): 20% Coverage (DBS): 84.2%	31.2% and 35%
		Prisons (n=2) (sample size: 3600[a])	Number tested (DBS): 160 Comparative study (DBS): ORs for effect of the intervention on testing rate: 0.86; 95% CI: 0.71-1.06; P=0.153	33.8%
		Drug clinics and prisons (n=1) (sample size: 6,550 intervention, 5,800 control)	Comparative study coverage (DBS) intervention: 8.4% before, 20.6% during intervention control: 7.7% before, 5.4% during intervention	32% (overall)
		STI clinics and GP practices (n=1) (sample size: 29,600)	Coverage (oral): 15.2%	0.6%
		Specialist services[b] (n=1) (sample size: 1,322)		55%
		Pharmacies (n=2) (sample size: 143 intervention, 561 control; 244 conventional care pathway; 262 pharmacist care pathway)	Comparative study coverage (DBS): 30% intervention; 13% control. OR: 2.25 (95% CI 1.48 - 3.42) Comparative study coverage (DBS): 24% conventional care pathway; 36% pharmacist care pathway	Comparative study: 25.9% conventional care pathway; 26.5% pharmacist care pathway
Education	HCV			
	N=1 study [33] Quality: High	Targeted at risk groups Drug services (n=1) (sample size: 52)	Comparative study coverage: 7% control; 20% intervention (NS) Willingness for HCV screening: Control: 89%; 56%; 67% (baseline; after 1 mo; after 3 mo) Intervention: 86%; 96%; 100%; 77%; 100% (baseline; after info; after 1 mo; after 3 mo; after FibroScan)	
Campaign	HCV			
	N=2 studies [9, 34] Quality: 2 studies NA	Targeted at general pop. Mixed settings (n=1), STI clinic/Prison (n=1) (sample size: 4,200 and 33,667[a])	Coverage from mixed settings: 2.3% - 3.7%	Comparative study: prison: 44.4% before, 27.0% during intervention STI clinic: 5.2% before, 3.5% during intervention 45% - 53% newly diagnosed
Guideline	HCV			
	N=1 study [35] Quality: NA	STI clinics (n=1) (sample size: NR)	Comparative study: Coverage: 4.7% before, 13.6% after intervention	

Intervention	Studies included	Setting/target population	Coverage/number of tests/tested*	Positivity rate
Clinical decision making tools Computer-assisted self/personal interviewing (CASI/CAPI) vs paper & pen (PAPI, control)	HBV			
	N=1 study [36] Quality: High	STI clinic (n=1) (sample size: 2318)	Coverage: PAPI: 16%; CAPI: 24%; CASI: 17%	Any STI: PAPI: 10%; CAPI: 11%; CASI: 10%
	HCV			
	N=1 study [36] Quality: High	STI clinic (n=1) (sample size: 2318)	Coverage: PAPI: 3%; CAPI: 9%; CASI: 3%	Any STI: PAPI: 10%; CAPI: 11%; CASI: 10%

[a] Denominator not reported for all studies.
[b] specialist services mainly targeting PWID
** Number of tests is only reported here if no data on coverage is available*
BBV: blood borne virus; CASI: computer assisted self-interviewing; CAPI: computer assisted personal interviewing; CI: confidence interval; DBS: dried blood spot; GP: general practitioner; HBV: hepatitis B virus; HCV: hepatitis C virus; HIV: human immunodeficiency virus; mo: months; MSM: men who have sex men; NA: not applicable; NS: not significant; OR: odds ratio; PAPI: pen and paper interviewing; RT: rapid test; STI: sexually transmitted infection

Table 4. Evidence base for the effectiveness of testing initiatives in community settings

Intervention	Studies included	Target population	Test offer	Coverage/number of tests/tested*	Positivity rate
All per setting	HBV				
	N=18 studies [37-54] Quality: 3 studies acceptable 15 studies NA	Community based testing sites (n=2) (sample size: 512 and 744)		Coverage: 37% and 71.1%	8.3% and 9.4%
		Outreach (n=11) (sample size: 30-86,000)	100%	Number tested/tests: 299 – 1,090 Coverage: 9.8%-76.2% Comparative study coverage: 1.5% control; 42.8% intervention (outreach education + testing at health centre); 59.7% intervention (outreach education + on-site test) Comparative study: Uptake: 53.3% DBS postal kit; 83.3% nurse-led sauna outreach testing; 100% standard STI clinic testing	0-12.4% Comparative study: 0% control; 2.1% intervention (outreach education + testing at health centre); 4.8% intervention (outreach education + on-site test)
		Drug services/harm reduction programmes (n=2) (sample size: intervention 27, control 28; 391)		Coverage: 49% Comparative study coverage: Intervention (oral) 92.6%; control (referral) 7.4%	20% (anti-HBc)
		Online tools (n=3) (sample size: 265 and 1,400[a])		Coverage: 16.2% 4305 self-sampling kits requested; 48% of requested kits returned Comparative study coverage: 43.9% intervention (behavioural tailoring plus cultural tailoring) (OR 0.94 95% CI 0.69-1.26); 43.5% intervention (behavioural tailoring) (OR 0.88 95% CI 0.65-1.19) 46.0% control	0% and 0.2%
	HCV				
	N=23 studies [9, 29, 30, 38-40, 43-47, 50-53, 55-62] Quality: 3 studies acceptable 20 studies NA	Community based testing sites (n=3) (sample size: 32 – 744)		Number tested/tests: 95 Coverage: 37% and 71.1%	0% - 6.3%
		Outreach (n=7) (sample size: 30-65,000)	100%	Number tested/tests: 491-520 Coverage: 9.8%-76.2% Comparative study coverage: 1.5% control; 42.8% intervention (outreach education + testing at health centre); 59.7% intervention (outreach education + on-site test) Comparative study coverage: Coverage: 53.3% DBS postal kit; 83.3% nurse-led sauna outreach testing; 100% standard STI clinic testing	0.8%-37.6% Comparative study: 0% control; 3.2% intervention (outreach education + testing at health centre); 2.8% intervention (outreach education + on-site test) Comparative study: HBV/HCV active; cleared infection 6.25%; 25% DBS postal kits 0%; 4% nurse-led sauna outreach testing 0%; 0% standard STI clinic testing
		Drug services/harm reduction programmes (n=8) (sample size: 27 – 5,399)		Comparative study: 67 tests before 973 during Coverage: 42% - 84.2% Comparative study coverage: Intervention (oral) 100%; control (referral) 7.4% Comparative study: 44% intervention; 51% control	18% - 53% Comparative study: 15% intervention; 14% control Comparative study: 19.4% before; 38.1% during.
		Online tools (n=2) (sample size: 265 and 9,653)	15,3%	Coverage: 4.4% and 16.2%	4.5% and 4.6%
		Combined settings (n=3) (sample size: 240 and 564[a])	73%	Number tested/tests: 266 Coverage: 37% and 72%	4.8% - 35%
Risk group testing	HBV				
	N=16 studies [37-43, 45-53] Quality: 3 studies acceptable	Drug users (n=3) (Sample size: intervention 27, control 28; 391[a])	100%	Coverage: 49% - 76.2% Comparative study coverage: Intervention (oral) 92.6%; control (referral) 7.4%	0% 20% (anti-HBc)
		Homeless (n=1) (Sample size: NR)		Number tested/tests: 491	12.4%

Intervention	Studies included	Target population	Test offer	Coverage/number of tests/tested*	Positivity rate
	13 studies NA	Migrants (n=9) (Sample size: 744 - 65,000[a])		Number tested/tests: 299 – 1,090 Coverage: 9.8% - 71.1% Comparative study coverage: 43.9% intervention (behavioural tailoring plus cultural tailoring) (OR 0.94 95% CI 0.69-1.26); 43.5% intervention (behavioural tailoring) (OR 0.88 95% CI 0.65-1.19) 46.0% control	0.6% - 8.7%
		MSM (n=2) (Sample size: 30-265)		Coverage: 16.2% Comparative study: Coverage: 53.3% DBS postal kit; 83.3% outreach sauna nurse; 100% standard STI clinic	0% Comparative study: HBV/HCV active; cleared infection 6.25%; 25% DBS postal kits 0%; 4% nurse-led sauna outreach testing 0%; 0% standard STI clinic testing
		Underprivileged people[b] (n=1) (Sample size: 811 control; 222 intervention; 243 intervention + on-site test		Comparative study coverage: 1.5% control; 42.8% intervention (outreach education + testing at health centre); 59.7% intervention (outreach education + on-site test)	Comparative study: 0% control; 2.1% intervention (outreach education + testing at health centre); 4.8% intervention (outreach education + on-site test)
	HCV				
	N=20 studies [29, 30, 38-40, 42, 43, 45-47, 50-52, 55-61] Quality: 2 studies acceptable 18 studies NA	Drug users (n=6) (Sample size: 27 – 9,653)	100%	Number tested/tests: 266 Coverage: 49% - 84.2% Comparative study coverage: Intervention (oral) 100%; control (referral) 7.4%	31.2% - 41%
		PWID (n=3) (Sample size: 240 and 3,463[a])	73%	Number tested/tests: 24-202 Coverage: 42% and 72%	18% and 20.3%
		Homeless (n=2) (Sample size: NR)		Number tested/tests: 95-491	6.3% and 13%
		Migrants (n=5) (Sample size: 744 – 65,000)		Number tested/tests: 520 Coverage: 9.8% - 71.1%	0.3% -4.7%
		MSM (n=2) (Sample size: 30-265)		Coverage: 16.2% Comparative study: Coverage: 53.3% DBS postal kit; 83.3% outreach sauna nurse; 100% standard STI clinic	4.6% Comparative study: HBV/HCV active; cleared infection 6.25%; 25% DBS postal kits 0%; 4% nurse-led sauna outreach testing 0%; 0% standard STI clinic testing
		Underprivileged people[b] (n=1) (Sample size: 811 control; 222 intervention; 243 intervention + on-site test		Comparative study coverage: 1.5% control; 42.8% intervention (outreach education + testing at health centre); 59.7% intervention (outreach education + on-site test)	Comparative study: 0% control; 3.2% intervention (outreach education + testing at health centre); 2.8% intervention (outreach education + on-site test)
		Risk groups (n=1) (sample size: 9653)	15.3%	Coverage: 4.4%	4.5%
Novel testing	HBV				
	N=8 studies [38, 43-45, 49, 51, 53, 54] Quality: 1 study acceptable 7 studies NA	Drug users (n=3) (Sample size: intervention 27, control 28; 391[a])	100%	Coverage (DBS): 49% Coverage (FibroScan): 76.2% Comparative study coverage: Intervention (oral) 92.6%; control (referral) 7.4%	0% 20% (anti-HBc)
		Migrants (n=2) (sample size: 21,000 and 65,000[c])		Number tested/tests (DBS): 229 – 1,126	8.7%
		MSM (n=1) (Sample size: 30 per group)		Comparative study: Coverage: 53.3% DBS postal kit; 83.3% outreach sauna nurse; 100% standard STI clinic	Comparative study: HBV/HCV active; cleared infection 6.25%; 25% DBS postal kits 0%; 4% nurse-led sauna outreach testing 0%; 0% standard STI clinic testing
		Students (n=1) (Sample size: 512)		Coverage (DBS): 37%	9.4%
		General pop (n=1) (Sample size: NR)		4305 self-sampling kits requested; 48% of requested kits returned	0.2%
	HCV				
	N=13 studies [9, 29, 30, 38, 43-45, 51, 53, 55, 56, 59, 60] Quality: 1 study acceptable 12 studies NA	Drug users (n=7) (Sample size: 27 – 1,123)		Number tested/tests (DBS): 266 Coverage (DBS): 13%- 49% Coverage (FibroScan): 76.2% Comparative study coverage: Intervention (oral) 100%; control (referral) 7.4% Comparative study (DBS): 3-fold increase in testing (RR=3.5, p<0.001)	27.5% - 53% Comparative study (DBS): 12-fold increase in positives (RR=12.1, p<0.001)
		PWID (n=2) (Sample size: 240[a])	73% (oral)	Number tested/tests (DBS): 202 Coverage (oral): 72%	20.3% (oral)
		Homeless (n=1) (Sample size: NR)		Number tested/tests (DBS): 95	6.3%
		Migrants (n=1) (Sample size: 65,000)		Number tested/tests (DBS): 520	0.8%

Intervention	Studies included	Target population	Test offer	Coverage/number of tests/tested*	Positivity rate
		MSM (n=1) (Sample size: 30 per group)		Comparative study: Coverage: 53.3% DBS postal kit; 83.3% outreach sauna nurse; 100% standard STI clinic	Comparative study: HBV/HCV active; cleared infection 6.25%; 25% DBS postal kits 0%; 4% nurse-led sauna outreach testing 0%; 0% standard STI clinic testing
		Students (n=1) (Sample size: 512)		Coverage (DBS): 37%	0%
Education	HBV				
	N=3 studies [40, 42, 50] Quality: 1 study acceptable 2 studies NA	Targeted at risk groups Underprivileged people[b] (n=1) (sample size: 811 control; 222 intervention; 243 intervention + on-site test) Migrants (n=2) (sample size: 1,500 and 6,337		Coverage: 11.2% and 31% Comparative study coverage: 1.5% control; 42.8% intervention (outreach education + testing at health centre); 59.7% intervention (outreach education + on-site test)	1.1% and 2.8% Comparative study 0% control; 2.1% intervention (outreach education + testing at health centre); 4.8% intervention (outreach education + on-site test)
	HCV				
	N=4 studies [40, 42, 50, 62] Quality: 1 study acceptable 3 studies NA	Targeted at risk groups Underprivileged people[b] (n=1) (sample size: 811 control; 222 intervention; 243 intervention + on-site test) Migrants (n=2) (sample size: 1,500 and 6,337) PWID (n=1) (sample size: 88)		Coverage: 11.2% and 31% Comparative study coverage: 1.5% control; 42.8% intervention (outreach education + testing at health centre); 59.7% intervention (outreach education + on-site test) Comparative study: 78% control; 85% intervention	0.3% and 2.4% Comparative study HCV: 0% control; 3.2% intervention (outreach education + testing at health centre); 2.8% intervention (outreach education + on-site test) Comparative study: 14% control; 15% intervention
Campaign	HBV				
	N=4 studies [37, 41, 42, 49] Quality: 4 studies NA	Targeted at risk groups Migrants (n=4) (sample size: 6,337-29,000)		Number tested/tests: 299 and1,090 Coverage: 11.2% and 15.3%	2.8%-8.7% 2.9% newly diagnosed
	HCV				
	N=3 studies [9, 42, 61] Quality: 3 studies NA	Targeted at risk groups Migrants (n=1) (sample size: 6,337)		Coverage: 11.2%	0.3%
		Targeted at GPs and those at risk General pop. (n=1) (sample size: 5,339)		Comparative study number tested/tests: 67 before; 973 during	Comparative study: 19.4% before; 38.1% during
		Targeted at public General pop. (n=1) (sample size: 9653)		15.3% website visitors offered testing. Coverage: 4.4%	4.5%
National programme	HCV				
	N=2 studies [9, 57] Quality: 2 studies NA	PWID (n=1) (sample size: 3,463)		Coverage: 42%	18%
		General population (n=1) (sample size: 5,399)		Comparative study: Coverage before and after programme: 26% (in 2000); 62% (in 2008)	Comparative study: 19.4% before; 38.1% during
Communication & technology	HBV				
	N=2 studies [46, 48] Quality: 1 study acceptable 1 study NA	MSM (n=1) (sample size: 265)		Coverage: 16.2%	0%
		Migrants (n=1) (HCV n=0, HBV n=1 sample:432-496)		Comparative study coverage: 43.9% BCT; 43.5% BT; 46.0% GI ORs (95%CI): BCT vs GI: 0.94 (0.69-1.26) BT vs GI: 0.88 (0.65-1.19)	
	HCV				
	N=2 studies [46, 61] Quality: 2 studies NA	MSM (n=1) (sample size: 265)		Coverage: 16.2%	4.6%
		General population (n=1) (sample size: 9653)		15.3% website visitors offered testing. Coverage: 4.4%	4.5%

[a] Denominator not reported by all studies
[b] Unemployed, social assistance beneficiaries and seekers of political asylum living in long-term shelters.
** Number of tests is only reported here if no data on coverage is available.*
anti-HBC: antibody to the hepatitis B core antigen; BCT: behavioural plus cultural tailoring; BT: behavioural tailoring; CI: confidence interval; DBS: dried blood spot; GI: generic information; HBV: hepatitis B virus; HCV: hepatitis C virus; HIV: human immunodeficiency virus; MSM: men who have sex with men; NA: not applicable; OR: odds ratio; PWID: people who inject drugs; STI: sexually transmitted infection; TB: tuberculosis

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Annex 2. Supplementary materials

PICO questions

Table A-1. PICO on topic testing

1	**What approaches to increase coverage and uptake of hepatitis B/C testing have been implemented in the EU/EEA and how effective are they?**
P	General population and population subgroups possibly at risk for and/or with a high burden of hepatitis B or C
I	Interventions to increase coverage and uptake of hepatitis B/C testing
C	No intervention/other intervention
O	Qualitative outcomes: • Description of intervention • Acceptance/barriers to testing • Feasibility of testing intervention Quantitative outcomes: • Offer of test • Uptake and coverage of testing • Positivity rate/diagnosis rate • Changes in prevalence/incidence

Table A-2. PICO on topic linkage to care

2	**What linkage-to-care strategies have been implemented in the EU/EEA for hepatitis B/C and how effective are they?**
P	Newly diagnosed patients/persons testing negative
I	Interventions to increase linkage to care
C	No intervention/other intervention
O	Qualitative outcomes: • Description of intervention • Acceptance/barriers to linkage to care • Feasibility of intervention Quantitative outcomes: • Proportion of persons referred to care/preventative care • Proportion of persons linked to care/preventative care • Proportion of persons receiving care/preventative care

Search strings

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[ti] 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[ti] OR hep c[tiab] OR blood borne virus*[tiab] or bbv[ti]

#b string for testing

"Mass Screening"[Mesh] OR "Mandatory Testing"[Mesh] OR "Point-of-Care Testing"[Mesh] OR "Dried Blood Spot Testing"[Mesh] OR "Early Diagnosis"[Mesh:NoExp] OR "mandatory test"[tiab] OR "mandatory testing"[tiab] OR "Point-of-Care"[tiab] OR "Dried Blood Spot"[tiab] OR screen[tiab] OR screened[tiab] OR screening[tiab] OR "hepatitis B testing"[tiab] OR "HBV testing"[tiab] OR "hepatitis B test"[tiab] OR "HBV test"[tiab] OR "testing for hepatitis B"[tiab] OR "testing for hbv"[tiab] OR "test for hepatitis B"[tiab] OR "test for hbv"[tiab] OR "hepatitis C testing"[tiab] OR "HCV testing"[tiab] OR "hepatitis C test"[tiab] OR "HCV test"[tiab] OR "testing for hepatitis C"[tiab] OR "testing for hcv"[tiab] OR "test for hepatitis C"[tiab] OR "test for hcv"[tiab] OR "bedside test"[tiab] OR "bedside testing"[tiab] OR diagnos*[tiab] OR (case*[tiab] AND (find*[tiab] OR identif*[tiab] OR detect*[tiab]))

#c string for linkage to care

((uptake[tiab] OR adhere*[tiab] OR comply*[tiab] OR compliance[tiab] OR complied[tiab] OR retain*[tiab] OR retention[tiab] OR link*[tiab] OR initiat[tiab] OR begin*[tiab] OR began[tiab] OR start*[tiab] enter*[tiab] OR commence*[tiab] OR refer*[tiab]) AND (care[tiab] OR healthcare[tiab] OR treat*[tiab] OR therap*[tiab])) OR prevent[tiab] OR prevention[tiab] OR preventative[tiab]

#d string for intervention

"Program Evaluation"[Mesh] OR "Health Promotion"[Mesh] OR "Feasibility Studies"[Mesh] OR "Pilot Projects"[Mesh] OR intervention*[tiab] OR approach*[tiab] OR program*[tiab] OR campaign*[tiab] OR promot*[tiab] OR pilot*[tiab] OR evaluation*[tiab] OR appraisal*[tiab] OR assessment*[tiab] OR feasibility[tiab] OR service*[tiab] OR strateg*[tiab] OR outreach[tiab] OR scheme*[tiab] OR project*[tiab] OR policy[tiab] OR policies[tiab] OR audit*[tiab] OR (community[tiab] AND based[tiab])

#d 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 "Peninsule Iberique"[ad] OR "Iberiar Penintsula"[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])) 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Liege[tw] OR Luik[tw] OR Luttich[tw] OR Limbourg[tw] OR Limburg[tw] OR Namur[tw] OR Namen[tw] OR Ostflandern[tw] OR Westflandern[tw] OR Ghent[tw] OR Gent[tw] OR Gand[tw] OR Charleroi[tw] OR Bruges[tw] OR Brugge*[tw] OR Schaerbeek[tw] OR Schaarbeek[tw] OR Anderlecht[tw] OR Leuven[tw] OR Louvain[tw]) OR ("Bulgaria"[Mesh] OR Bulgaria*[tw] OR Balgariya[tw] OR Balgarija[tw] OR Blagoevgrad*[tw] OR "Pirin Macedonia"[tw] OR Burgas[tw] OR Dobrich[tw] OR Gabrovo[tw] OR Haskovo[tw] OR Kardzhali[tw] OR Kurdzhali[tw] OR Kyustendil[tw] OR Lovech[tw] OR Lovec[tw] OR Montana[tw] OR Pazardzhik[tw] OR Pernik[tw] OR Pleven*[tw] OR Plovdiv[tw] OR Razgrad[tw] OR Rousse[tw] OR Ruse[tw] OR Rusenka[tw] OR Shumen[tw] OR Silistra[tw] OR Sliven[tw] OR Smolyan[tw] OR Sofia[tw] OR Sofyiska[tw] OR Sofiiska[tw] OR "Stara Zagora"[tw] OR Targovishte[tw] OR Varna[tw] OR "Veliko Tarnovo"[tw] OR Vidin[tw] OR Vratsa[tw] OR Vratza[tw] OR Yambol[tw]) OR ("Croatia"[Mesh] OR Croat*[tw] OR Hrvatsk*[tw] OR hrvati[tw] OR Bjelovar[tw] OR "Bjelovarsko bilogorska"[tw] OR "Brod Posavina"[tw] OR "Brodsko posavska"[tw] OR "Dubrovnik Neretva"[tw] OR "dubrovacko neretvanska"[tw] OR Zagreb[tw] OR Zagrebacka[tw] OR Istria[tw] OR Istarska[tw] OR Karlovacka[tw] OR Karlovac[tw] OR "Koprivnicko krizevacka"[tw] OR Koprivnica[tw] OR Krizevci[tw] OR "Krapina Zagorje"[tw] OR "Krapinsko zagorska"[tw] OR "Lika Senj"[tw] OR "Licko senjska"[tw] OR Medimurska[tw] OR Medimurje[tw] OR Osijek[tw] OR Baranja[tw] OR "Osjecko baranjska"[tw] OR "Pozega Slavonia"[tw] OR "Pozesko slavonska"[tw] OR "Primorje Gorski Kotar"[tw] OR "Primorsko goranska"[tw] OR "Sibensko kninska"[tw] OR "Sibensko kninske"[tw] OR Sibenik[tw] OR Knin[tw] OR Sisak[tw] OR "Sisacko moslavacka"[tw] OR Moslavina[tw] OR "Splitsko dalmatinska"[tw] OR Split[tw] OR Dalmatia[tw] OR Varazdin[tw] OR Varazdinska[tw] OR Viroviticko[tw] OR podravska[tw] OR Virovitica[tw] OR Podravina[tw] OR "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 Paphos[tw] OR Pafos[tw] OR Baf[tw] OR Strovolos[tw] OR Lakatamia[tw] OR Lakadamya[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 Plzen*[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 Sjaelland[tw] OR Sealand[tw] OR "Zealand region"[tw] OR "region Zealand"[tw] OR Syddanmark[tw] OR Jutland[tw] OR Jylland[tw] OR Sonderjyllands[tw] OR Copenhagen[tw] OR Kobenhavn[tw] OR Arhus[tw] OR Aarhus[tw] OR Bornholm[tw] OR Frederiksberg[tw] OR Frederiksborg[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 Harjumaa[tw] OR Hiiu[tw] OR Hiiumaa[tw] OR "Ida Viru"[tw] OR "Ida Virumaa"[tw] OR Jarvamaa[tw] OR Jarva[tw] OR Jogevamaa[tw] OR Jogeva[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 Karelen[tw] OR Ostrobothnia[tw] OR Pohjanmaa[tw] OR Osterbotten[tw] OR Savonia[tw] OR Savo[tw] OR Savolax[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 Lappland[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 Jyvaskyla[tw] OR Kuopio[tw] OR Lahti[tw] OR Lahtis[tw] OR Kouvola[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 Auvernhe[tw] OR Auvernha[tw] OR Normandie[tw] OR Normandy[tw] OR Normaundie[tw] OR Bourgogne[tw] OR Burgundy[tw] OR Bregogne[tw] OR Borgoegne[tw] OR Borgogne[tw] OR Brittany[tw] OR Breizh[tw] OR Bertaeyn[tw] OR Bretagne[tw] OR "Champagne Ardenne"[tw] OR Corse[tw] OR Corsica[tw] OR "Franche Comte"[tw] OR "Frantche 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 "Broiou al Liger"[tw] OR Picardie[tw] OR Picardy[tw] OR "Poitou Charentes"[tw] OR "Peitau Charantas"[tw] OR "Poetou-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 Ariege[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 "Hauts de Seine"[tw] OR Herault[tw] OR "Ile de France"[tw] OR "Ille 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 department[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 (department[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 Hessia[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 "Ionion 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 Agaiou"[tw] OR "Notio Aigaio"[tw] OR Peloponnese[tw] OR Peloponniso*[tw] OR Thessaly[tw] OR Thessalia[tw] OR Thessalian[tw] OR Petthalia[tw] OR "Voreio Aigaio"[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 Cycklades[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 Mhuineachain[tw] OR Cavan[tw] OR "An Cabhan"[tw] OR "An Cabhain"[tw] OR Longford[tw] OR "An Longfort"[tw] OR "an Longfoirt"[tw] OR Langfurd[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 Lairge"[tw] OR Watterford[tw] OR Cork[tw] OR Corcaigh[tw] OR Chorcai[tw] OR Kerry[tw] OR Ciarrai[tw] OR Chiarrai[tw] OR Limerick[tw] OR Luimneach[tw] OR Luimnigh[tw] OR Tipperary[tw] OR "Tiobraid Arann"[tw] OR "Thiobraid Arann"[tw] OR Clare[tw] OR "An Clar"[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 Liatroim[tw] OR Liatroma[tw] OR Donegal[tw] OR "Dhun na nGall"[tw] OR Dinnygal[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 Connachta[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 Latgalia[tw] OR Vidzeme[tw] OR Vidumo[tw] OR Semigallia[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 Wolmar[tw] OR Ventspils[tw] OR Windau[tw] OR Ogre[tw]) OR ("Lithuania"[Mesh] OR Lithuania*[tw] OR "Lietuvos Respublika"[tw] OR Lietuva[tw] OR lietuviu[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 Siauliu[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 Luxemburg[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 Duedelingen[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 Ettelbreck[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 "Ill Belt"[tw] OR Birkirkara[tw] OR "B Kara"[tw] OR "B'Kara"[tw] OR Birchircara[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 Naxxar[tw] OR Gwann[tw] OR "St John"[tw] OR Zebbug[tw] OR "Citta 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 Overissel[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 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 Mazowske[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 "Varmia Mazuria"[tw] OR "Varmian Mazurian"[tw] OR "Varmia Masuria"[tw] OR "Varmian Masurian"[tw] OR "Warmia Mazury"[tw] OR "Warminsko 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 Cimbra[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 (Agualva[tw] AND Cacem[tw])) OR ("Romania"[Mesh] OR Romania*[tw] OR Rumania*[tw] OR Roumania*[tw] OR Romani[tw] OR Rumani[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 Brasso[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 Dambovita[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 Suceava[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 Temeswar[tw] OR Temeschburg[tw] OR Temeschwar[tw] OR Temesvar[tw] OR Temisvar[tw] OR Timisvar[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 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 Trentschin[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 Neustadtl[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 Badajos[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 Lerida[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 Saragossa[tw] OR "Las Palmas"[tw] OR Bilbao[tw] OR Bilbo[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 Malmo[tw] OR Vasteras[tw] OR Linkoping[tw] OR Helsingborg[tw] OR Halsingborg[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 Scotland[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 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 Anthrim[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 Lunnonderrie[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 Kirkcudbrightshire[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 Anthrim[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 Malmo[ad] OR Vasteras[ad] OR Linkoping[ad] OR Helsingborg[ad] OR Halsingborg[ad] OR Norrkoping[ad]) OR (Spain[ad] OR Espana[ad] OR Spanish[ad] OR Espanol*[ad] OR Spaniard*[ad] OR Andalucia[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 Cataluna[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 Baleares[ad] OR "La Rioja"[ad] OR "Pais Vasco"[ad] OR "Basque Country"[ad] OR "Baske region"[ad] OR Euskadi[ad] OR Asturias[ad] OR Murcia[ad] OR Coruna[ad] OR Alava[ad] OR Araba[ad] OR Albacete[ad] OR Alicante[ad] OR Alacant[ad] OR Almeria[ad] OR Avila[ad] OR Badajoz[ad] OR Badajos[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 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 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 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 Laibach[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 Neustadtl[ad] OR Domzale[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 Banskobystri*[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 Trentschin[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 Deutschendorf[ad] OR Zvolen[ad]) OR (Romania*[ad] OR Rumania*[ad] OR Roumania*[ad] OR Romani[ad] OR Rumani[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 Timisvar[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 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[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 (Agualva[ad] AND Cacem[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 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 "Varmia Mazuria"[ad] OR "Varmian Mazurian"[ad] OR "Varmia Masuria"[ad] OR "Varmian 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 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 Nimeguen[ad]) OR (Malta[ad] OR Maltese*[ad] OR Maltin[ad] OR Gozo[ad] OR Ghawdex[ad] OR Valletta[ad] OR "Ill Belt"[ad] OR Birkirkara[ad] OR "B Kara"[ad] OR "B'Kara"[ad] OR Birchircara[ad] OR Mosta[ad] OR Qormi[ad] OR "St Paul s Bay"[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 (Luxembourg*[ad] OR Luxemburg[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 Schifflange[ad] OR Scheffleng[ad] OR Schifflingen[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 Klaipedos[ad] OR Marijampoles[ad] OR Marijampole[ad] OR Panevezys[ad] OR Panevezio[ad] OR Siauliai[ad] OR Siauliu[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 Latgalia[ad] OR Vidzeme[ad] OR Vidumo[ad] OR Semigallia[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 "Vallee d'Aoste"[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 Chorcai[ad] OR Kerry[ad] OR Ciarrai[ad] OR Chiarrai[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 Clar"[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 Laighean"[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 Bre[ad] OR Navan[ad] OR "An Uaimh"[ad]) OR (Hungar*[ad] OR Magyarorszag[ad] OR Magyar*[ad] OR Dunantuli[ad] OR Transdanubia[ad] OR Dunantul[ad] OR "Great Plain"[ad] OR "Eszak Alfold"[ad] OR "Del Alfold"[ad] OR "Alfold es eszak"[ad] OR "Northern Alfold"[ad] OR "North Alfold"[ad] OR "South Alfold"[ad] OR "Southern Alfold"[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 gyor[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 Gyor[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 "Perifereia Ipeirou"[ad] OR "North aegean"[ad] OR "Northern Aegean"[ad] OR "Aegean islands"[ad] OR "Aegean island"[ad] OR "Nisoi Agaiou"[ad] OR "Notio Aigaio"[ad] OR Peloponnese[ad] OR Peloponniso*[ad] OR Thessaly[ad] OR Thessalia[ad] OR Thessalian[ad] OR Petthalia[ad] OR "Voreio Aigaio"[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 Heraclion[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 Hessia[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 Thueringen[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 Auvernhe[ad] OR Auvernha[ad] OR Normandie[ad] OR Normandy[ad] OR Normaundie[ad] OR Bourgogne[ad] OR Burgundy[ad] OR Bregogne[ad] OR Borgoegne[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 Pirineos"[ad] OR "Pays de la Loire"[ad] OR "Broiou al Liger"[ad] OR Picardie[ad] 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 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 "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 "Ille 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 (department[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 Karelen[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 Lappland[ad] OR "Paijat 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 Vantaa[ad] OR Vanda[ad] OR Oulu[ad] OR Uleaborg[ad] OR Turku[ad] OR Abo[ad] OR Jyvaskyla[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 Hiiu[ad] OR Hiiumaa[ad] OR "Ida Viru"[ad] OR "Ida Virumaa"[ad] OR Jarvamaa[ad] OR Jarva[ad] OR Jogevamaa[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 "Kohtla 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 Sjaelland[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 Kobenhavn[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 Prag[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 Lakadamya[ad] OR "Kato Polemidia"[ad] OR "Kato Polemidhia"[ad] OR Aglandjia[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 Karlovacka[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 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 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 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 (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 Schaerbeek[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 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]))

Embase 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 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 OR 'hep c':ti,ab OR 'blood borne virus':ti,ab OR 'blood borne viruses':ti,ab OR 'bbv':ti

#b string for testing

'mass screening'/exp OR 'mandatory testing'/exp OR 'point of care testing'/exp OR 'dried blood spot testing'/exp OR 'early diagnosis'/de OR 'mandatory test':ti,ab OR 'mandatory testing':ti,ab OR 'point of care':ti,ab OR 'dried blood spot':ti,ab OR screen:ti,ab OR screened:ti,ab OR screening:ti,ab OR ('hepatitis B' NEAR/2 test*):ti,ab OR ('hepatitis C' NEAR/2 test*):ti,ab OR (hbv NEAR/2 test*):ti,ab OR (hcv NEAR/2 test*):ti,ab OR 'bedside test':ti,ab OR 'bedside testing':ti,ab OR diagnos*:ti,ab OR (case* NEAR/2 find*):ti,ab OR (case* NEAR/2 identif*):ti,ab OR (case* NEAR/2 detect*):ti,ab

#c string for linkage to care

((uptake OR adhere* OR comply* OR compliance OR complied OR retain* OR retention OR link* OR initiat* OR begin* OR began OR start* OR enter* OR commence* OR refer*) NEAR/4 (care OR healthcare OR treat* OR therap*)):ti,ab OR prevent:ti,ab OR prevention:ti,ab OR preventative:ti,ab

#d string for intervention

'program evaluation'/exp OR 'health promotion'/exp OR 'feasibility study'/exp OR 'pilot study'/exp OR intervention*:ti,ab OR approach*:ti,ab OR program*:ti,ab OR campaign*:ti,ab OR promot*:ti,ab OR pilot*:ti,ab OR evaluation*:ti,ab OR appraisal*:ti,ab OR assessment*:ti,ab OR feasibility:ti,ab OR service*:ti,ab OR strateg*:ti,ab OR outreach:ti,ab OR scheme*:ti,ab OR project*:ti,ab OR policy:ti,ab OR policies:ti,ab OR audit*:ti,ab OR (community NEAR/3 based):ti,ab

#d 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 efta: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 scandinavian: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 'iberiar 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 'czecho slovakia':ab,ti OR ceskoslovensko:ab,ti OR 'cesko slovensko':ab,ti OR 'benelux'/exp OR benelux:ab,ti OR fennoscandia:ab,ti OR 'fenno scandinavia':ab,ti OR fennoskandi*:ab,ti OR (visegrád:ab,ti AND (group:ab,ti OR four:ab,ti OR triangle:ab,ti)) OR 'visegrádská čtyřka':ab,ti OR 'visegrádská skupina':ab,ti OR 'visegrádi együttműködés':ab,ti OR 'visegrádi 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 'Southern 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 ostoesterreich: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 Hainault: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 Schaerbeek: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 bulgaria*:ti,ab OR balgariya:ab,ti OR balgarija: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 zagrebacka:ab,ti OR istria:ab,ti OR istarska:ab,ti OR karlovacka:ab,ti OR karlovac: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 'osjecko baranjska':ab,ti OR 'pozega 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 'cypriot'/exp OR cyprus:ab,ti OR cypriot*:ab,ti OR kypros:ab,ti OR kibris*:ab,ti OR kypriaki: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 ammochostos: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 lakadamya:ab,ti OR 'kato polemidia':ab,ti OR 'kato polemidhia':ab,ti OR aglandjia:ab,ti OR eglence:ab,ti OR aglantzia:ab,ti OR aradhippou:ab,ti OR aradippou: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 usteck*:ab,ti OR usti:ab,ti OR liberec*:ab,ti OR 'hradec kralove':ab,ti OR kralovehradec*:ab,ti OR pardubic*:ab,ti OR olomouc*:ab,ti OR olomoc:ab,ti OR holomoc:ab,ti OR moravskoslezs*: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 Sonderjyllands:ti,ab OR Copenhagen:ti,ab OR Kobenhavn:ti,ab OR Arhus:ti,ab OR Aarhus:ti,ab OR Bornholm:ti,ab OR Frederiksberg:ti,ab OR Frederiksborg:ti,ab OR Ringkjobing:ti,ab OR Viborg:ti,ab OR Vejle:ti,ab OR Roskilde:ti,ab OR Storstrøm:ti,ab OR Vestsjaellands:ti,ab OR 'West Zealand':ti,ab OR Funen:ti,ab OR Ribe:ti,ab OR 'Kalaallit Nunaat':ti,ab OR Gronland:ti,ab OR Foroyar:ti,ab OR Faeroerne:ti,ab OR 'Faroe islands':ti,ab OR Aalborg:ti,ab OR Alborg: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 Eesti:ti,ab OR Eestlased:ti,ab OR Eestlane:ti,ab OR Harju:ti,ab OR Harjumaa:ti,ab OR Hiiu:ti,ab OR Hiiumaa:ti,ab OR 'Ida Viru':ti,ab OR 'Ida Virumaa':ti,ab OR Jarvamaa:ti,ab OR Jarva:ti,ab OR Jogevamaa:ti,ab OR Jogeva: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 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Wurttemberg:ti,ab OR Bayern:ti,ab OR Bavaria:ti,ab OR Berlin:ti,ab OR Brandenburg:ti,ab OR Bremen:ti,ab OR Oldenburg:ti,ab OR Mitteldeutschland:ti,ab OR Rhein:ti,ab OR Rhine:ti,ab OR Hannover:ti,ab OR Braunschweig:ti,ab OR Göttingen:ti,ab OR Goettingen:ti,ab OR Nurnberg:ti,ab OR Nuernberg:ti,ab OR Ruhr:ti,ab OR Koln:ti,ab OR koeln:ti,ab OR Bonn:ti,ab OR Hamburg:ti,ab OR Hessen:ti,ab OR Hesse:ti,ab OR Hessia:ti,ab OR Mecklenburg:ti,ab OR Vorpommern:ti,ab OR Pomerania:ti,ab OR Niedersachsen:ti,ab OR Neddersassen:ti,ab OR Saxony:ti,ab OR Niederbayern:ti,ab OR 'Northern Rhine':ti,ab OR 'North Rhine':ti,ab OR Westphalia:ti,ab OR Westfalen:ti,ab OR 'Rhineland Palatinate':ti,ab OR 'Rheinland Pfalz':ti,ab OR Saarland:ti,ab OR Sachsen:ti,ab OR 'Schleswig Holstein':ti,ab OR Thuringia:ti,ab OR Thuringen:ti,ab OR Thueringen:ti,ab OR Munchen: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 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OR Groningen:ti,ab OR Limburg:ti,ab OR Brabant:ti,ab OR Holland:ti,ab OR Overijssel:ti,ab OR Overissel:ti,ab OR Utrecht:ti,ab OR Zeeland:ti,ab OR Amsterdam:ti,ab OR Rotterdam:ti,ab OR Hague:ti,ab OR 's-Gravenhage':ti,ab OR 'Den Haag':ti,ab OR Eindhoven:ti,ab OR Tilburg:ti,ab OR Almere:ti,ab OR Breda:ti,ab OR Nijmegen:ti,ab OR Nimeguen:ti,ab 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 Poles:ti,ab OR Polski:ti,ab OR Polak:ti,ab OR Polka:ti,ab OR Polacy:ti,ab OR Dolnoslaskie:ti,ab OR Silesia*:ti,ab OR Slask:ti,ab OR Pomorskie:ti,ab OR Pomerania*:ti,ab OR Kujawsko:ti,ab OR Kuyavian:ti,ab OR Lodzkie:ti,ab OR Lodz:ti,ab OR Lubelskie:ti,ab OR Lublin:ti,ab OR Lubuskie:ti,ab OR Lubusz:ti,ab OR Lubus:ti,ab OR Malopolskie:ti,ab OR Mazowieckie:ti,ab OR Mazowske:ti,ab OR Masovia:ti,ab OR Masovian:ti,ab OR Opolskie:ti,ab OR Opole:ti,ab OR Podkarpackie:ti,ab OR Subcarpathian*:ti,ab OR Podlaskie:ti,ab OR Podlachia:ti,ab OR Podlasie:ti,ab OR Slaskie:ti,ab OR Swietokrzyskie:ti,ab OR 'Varmia Mazuria':ti,ab OR 'Varmian Mazurian':ti,ab OR 'Varmia Masuria':ti,ab OR 'Varmian Masurian':ti,ab OR 'Warmia Mazury':ti,ab OR 'Warminsko Mazurskie':ti,ab OR 'Warmian Masurian':ti,ab OR Wielkopolskie:ti,ab OR Zachodniopomorskie:ti,ab OR Warsaw:ti,ab OR Warszawa:ti,ab OR Krakow:ti,ab OR Cracow:ti,ab OR Wroclaw:ti,ab OR Poznan:ti,ab OR Gdansk:ti,ab OR Szczecin:ti,ab OR Bydgoszcz:ti,ab OR Katowice:ti,ab OR 'Portugal'/exp OR 'Portuguese (citizen)'/exp OR Portugal:ti,ab OR Portugues*:ti,ab OR Azores:ti,ab OR Acores:ti,ab OR Madeira:ti,ab OR Alentejo:ti,ab OR Algarve:ti,ab OR Lisboa:ti,ab OR Lisbon:ti,ab OR 'Alto Tras-os-Montes':ti,ab OR (Ave NEAR/3 (community OR intermunicipal OR comunidade)):ti,ab OR Mondego:ti,ab OR Vouga:ti,ab OR Beira:ti,ab OR Cavado:ti,ab OR Lafoes:ti,ab OR Douro:ti,ab OR Porto:ti,ab OR Oporto:ti,ab OR Tejo:ti,ab OR Minho:ti,ab OR Setubal:ti,ab OR Pinhal:ti,ab OR 'Serra da Estrela':ti,ab OR Tamega:ti,ab OR Leira:ti,ab OR Santarem:ti,ab OR Beja:ti,ab OR Faro:ti,ab OR Evora:ti,ab OR Portalegre:ti,ab OR 'Castelo Branco':ti,ab OR Guarda:ti,ab OR Cimbra:ti,ab OR Aveiro:ti,ab OR Viseu:ti,ab OR Braganca:ti,ab OR Braganza:ti,ab OR Braga:ti,ab OR 'Vila real':ti,ab OR 'Viana do Castelo':ti,ab OR Gaia:ti,ab OR Amadora:ti,ab OR Funchal:ti,ab OR Coimbra:ti,ab OR Almada:ti,ab OR (Agualva:ti,ab AND Cacem:ti,ab) OR 'Romania'/exp OR 'Romanian (citizen)'/exp OR Romania*:ti,ab OR Rumania*:ti,ab OR Roumania*:ti,ab OR Romani:ti,ab OR Rumani:ti,ab OR Alba:ti,ab OR Arad:ti,ab OR Arges:ti,ab OR Bacau:ti,ab OR Bihor:ti,ab OR 'Bistrita Nasaud':ti,ab OR Botosani:ti,ab OR Braila:ti,ab OR Brasov:ti,ab OR Kronstadt:ti,ab OR Brasso:ti,ab OR Brassovia:ti,ab OR Coron:ti,ab OR Bucharest:ti,ab OR Bucuresti:ti,ab OR Buzau:ti,ab OR Calarasi:ti,ab OR 'Caras-Severin':ti,ab OR Cluj:ti,ab OR Klausenburg:ti,ab OR Kolozsvar:ti,ab OR Constanta:ti,ab OR Tomis:ti,ab OR Konstantia:ti,ab OR Kostence:ti,ab OR Covasna:ti,ab OR Dambovita:ti,ab OR Dolj:ti,ab OR Galati:ti,ab OR Galatz:ti,ab OR Galac:ti,ab OR Kalas:ti,ab OR Giurgiu:ti,ab OR Gorj:ti,ab OR Harghita:ti,ab OR Hunedoara:ti,ab OR Ialomita:ti,ab OR Iasi:ti,ab OR Jassy:ti,ab OR Lassy:ti,ab OR Ilfov:ti,ab OR Maramures:ti,ab OR Mehedinti:ti,ab OR Mures:ti,ab OR Neamt:ti,ab OR (Olt:ti,ab AND (river:ti,ab OR county:ti,ab OR region:ti,ab OR judetul:ti,ab OR Raul:ti,ab)) OR Prahova:ti,ab OR Salaj:ti,ab OR 'Satu Mare':ti,ab OR Sibiu:ti,ab OR Suceava:ti,ab OR Teleorman:ti,ab OR Timis:ti,ab OR Tulcea:ti,ab OR Valcea:ti,ab OR Vilcea:ti,ab OR Vaslui:ti,ab OR Vrancea:ti,ab OR Timisoara:ti,ab OR Temeswar:ti,ab OR Temeschburg:ti,ab OR Temeschwar:ti,ab OR Temesvar:ti,ab OR Temisvar:ti,ab OR Timisvar:ti,ab OR Temesva:ti,ab OR Craiova:ti,ab OR Ploiesti:ti,ab OR Ploesti:ti,ab OR Oradea:ti,ab OR Varad:ti,ab OR Varat:ti,ab OR 'Slovakia'/exp OR 'Slovak (citizen)'/exp OR 'Slovak

(people)'/exp OR Slovakia:ti,ab OR Slovensk*:ti,ab OR Slovak*:ti,ab OR Slovaci:ti,ab OR Slovenki:ti,ab OR Bratislav*:ti,ab OR Presporok:ti,ab OR Pressburg:ti,ab OR Preßburg:ti,ab OR Posonium:ti,ab OR Banskobystri*:ti,ab OR 'Banska Bystrica':ti,ab OR Neusohl:ti,ab OR Besztercebánya:ti,ab OR Kosic*:ti,ab OR Kaschau:ti,ab OR Kassa:ti,ab OR Nitrian*:ti,ab OR Nitra:ti,ab OR Neutra:ti,ab OR Nyitra:ti,ab OR Nyitria:ti,ab OR Trnav*:ti,ab OR Tyrnau:ti,ab OR Nagyszombat:ti,ab OR Tyrnavia:ti,ab OR Presov*:ti,ab OR Trencian*:ti,ab OR Trencin:ti,ab OR Trentschin:ti,ab OR Trencsén:ti,ab OR Zilina:ti,ab OR Sillein:ti,ab OR Zsolna:ti,ab OR Zylina:ti,ab OR (Martin:ti,ab AND (city:ti,ab OR Svaty:ti,ab)) OR Turócszentmárton:ti,ab OR Poprad:ti,ab OR Deutschendorf:ti,ab OR Zvolen:ti,ab OR 'Slovenia'/exp OR 'Slovenian (citizen)'/exp OR 'Slovene (people)'/exp OR Slovenia*:ti,ab OR Slovenija:ti,ab OR slovensk*:ti,ab OR Slovenci:ti,ab OR Slovene*:ti,ab OR Gorenjska:ti,ab OR Carniola:ti,ab OR Goriska:ti,ab OR Gorizia:ti,ab OR Jugovzhodna:ti,ab OR Koroska:ti,ab OR Carinthia:ti,ab OR 'Notranjsko kraska':ti,ab OR 'Obalno kraska':ti,ab OR 'Coastal karst':ti,ab OR Osrednjeslovenska:ti,ab OR Podravska:ti,ab OR Drava:ti,ab OR Pomurska:ti,ab OR Mura:ti,ab OR Savinjska:ti,ab OR Savinja:ti,ab OR Spodnjeposavska:ti,ab OR Zasavska:ti,ab OR 'Central Sava':ti,ab OR Posavska:ti,ab OR 'Lower Sava':ti,ab OR Ljubljana:ti,ab OR Laibach:ti,ab OR Lubiana:ti,ab OR Maribor:ti,ab OR 'Marburg an der Drau':ti,ab OR Kranj:ti,ab OR Carnium:ti,ab OR Creina:ti,ab OR Chreina:ti,ab OR Krainbur:ti,ab OR Koper:ti,ab OR Capodistria:ti,ab OR Kopar:ti,ab OR Celje:ti,ab OR 'Novo mesto':ti,ab OR Neustadtl:ti,ab OR Domzale:ti,ab OR Velenje:ti,ab OR Wollan:ti,ab OR Woellan:ti,ab OR 'Nova Gorica':ti,ab OR Kamnik:ti,ab OR 'Spain'/exp OR 'Spaniard'/exp OR 'Basque (people)'/exp OR Spain:ti,ab OR Espana:ti,ab OR Spanish:ti,ab OR Espanol*:ti,ab OR Spaniard*:ti,ab OR Andalucia:ti,ab OR Andalusia:ti,ab OR Aragon:ti,ab OR Arago:ti,ab OR Cantabria:ti,ab OR Canarias:ti,ab OR 'Canary Islands':ti,ab OR (Canaries:ti,ab AND island*:ti,ab) OR 'Castile and leon':ti,ab OR 'Castilla y Leon':ti,ab OR 'Castile La Mancha':ti,ab OR 'Castilla La Mancha':ti,ab OR Cataluna:ti,ab OR Catalonia:ti,ab OR Ceuta:ti,ab OR Madrid:ti,ab OR Melilla:ti,ab OR Navarra:ti,ab OR Navarre:ti,ab OR Valencia*:ti,ab OR Extremadura:ti,ab OR Galicia:ti,ab OR Balears:ti,ab OR 'Balearic Islands':ti,ab OR 'Balear Islands':ti,ab OR Baleares:ti,ab OR 'La Rioja':ti,ab OR 'Pais Vasco':ti,ab OR 'Basque Country':ti,ab OR 'Baske region':ti,ab OR Euskadi:ti,ab OR Asturias:ti,ab OR Murcia:ti,ab OR Coruna:ti,ab OR Alava:ti,ab OR Araba:ti,ab OR Albacete:ti,ab OR Alicante:ti,ab OR Alacant:ti,ab OR Almeria:ti,ab OR Avila:ti,ab OR Badajoz:ti,ab OR Badajos:ti,ab OR Barcelona:ti,ab OR Burgos:ti,ab OR Caceres:ti,ab OR Cadiz:ti,ab OR Castellon:ti,ab OR Castello:ti,ab OR 'Ciudad Real':ti,ab OR Cordoba:ti,ab OR Cuenca:ti,ab OR Eivissa:ti,ab OR Ibiza:ti,ab OR Formentera:ti,ab OR 'El Hierro':ti,ab OR Fuerteventura:ti,ab OR Galiza:ti,ab OR Girona:ti,ab OR Gerona:ti,ab OR 'Gran Canaria':ti,ab OR Granada:ti,ab OR Guadalajara:ti,ab OR Guipuzcoa:ti,ab OR Gipuzkoa:ti,ab OR Huelva:ti,ab OR Huesca:ti,ab OR Jaen:ti,ab OR 'La Gomera':ti,ab OR 'La Palma':ti,ab OR Lanzarote:ti,ab OR Leon:ti,ab OR Lleida:ti,ab OR Lerida:ti,ab OR Lugo:ti,ab OR Malaga:ti,ab OR Mallorca:ti,ab OR Majorca:ti,ab OR Menorca:ti,ab OR Minorca:ti,ab OR Murcia:ti,ab OR Ourense:ti,ab OR Orense:ti,ab OR Palencia:ti,ab OR Pontevedra:ti,ab OR Salamanca:ti,ab OR Segovia:ti,ab OR Sevilla:ti,ab OR Seville:ti,ab OR Soria:ti,ab OR Tarragona:ti,ab OR Tenerife:ti,ab OR Teruel:ti,ab OR Toledo:ti,ab OR Valladolid:ti,ab OR Vizcaya:ti,ab OR Biscay:ti,ab OR Zamora:ti,ab OR Zaragoza:ti,ab OR Saragossa:ti,ab OR 'Las Palmas':ti,ab OR Bilbao:ti,ab OR Bilbo:ti,ab OR 'Sweden'/exp OR 'Swedish citizen'/exp OR 'Swede (people)'/exp OR Sweden:ti,ab OR Sverige:ti,ab OR Swedish:ti,ab OR Svenska:ti,ab OR svenskar:ti,ab OR Swede:ti,ab OR Swedes:ti,ab OR Norrland:ti,ab OR Mellansverige:ti,ab OR Smaland:ti,ab OR Stockholm*:ti,ab OR Sydsverige:ti,ab OR Vastsverige:ti,ab OR Blekinge:ti,ab OR Dalarna:ti,ab OR Gavleborg*:ti,ab OR Gotland*:ti,ab OR Halland*:ti,ab OR Jamtland*:ti,ab OR Jonkoping*:ti,ab OR Kalmar:ti,ab OR Kronoberg*:ti,ab OR Norrbotten*:ti,ab OR Orebro:ti,ab OR Ostergotland*:ti,ab OR Skane:ti,ab OR Sodermanlands:ti,ab OR Uppsala:ti,ab OR Varmland*:ti,ab OR Vasterbotten*:ti,ab OR Vasternorrland*:ti,ab OR Vastmanland*:ti,ab OR vastergotland*:ti,ab OR Gotaland*:ti,ab OR Gothenburg:ti,ab OR Goteborg:ti,ab OR Malmo:ti,ab OR Vasteras:ti,ab OR Linkoping:ti,ab OR Helsingborg:ti,ab OR Halsingborg:ti,ab OR Norrkoping:ti,ab OR 'United Kingdom'/exp OR 'British citizen'/exp OR 'GB':ti,ab OR 'United kingdom':ti,ab OR 'UK':ti,ab OR Britain:ti,ab OR British:ti,ab OR England:ti,ab OR English:ti,ab OR Scotland:ti,ab OR Scottish:ti,ab OR Scots:ti,ab OR Wales:ti,ab OR Cymru:ti,ab OR Welsh:ti,ab OR 'North Ireland':ti,ab OR 'Northern Ireland':ti,ab OR Irish:ti,ab OR Avon:ti,ab OR Bedfordshire:ti,ab OR Berkshire:ti,ab OR Bristol:ti,ab OR Buckinghamshire:ti,ab OR Cambridgeshire:ti,ab OR 'Isle of Ely':ti,ab OR Cheshire:ti,ab OR Cleveland:ti,ab OR Cornwall:ti,ab OR Cumberland:ti,ab OR Cumbria:ti,ab OR Derbyshire:ti,ab OR Devon:ti,ab OR Dorset:ti,ab OR Durham:ti,ab OR Essex:ti,ab OR Gloucestershire:ti,ab OR Hampshire:ti,ab OR Southampton:ti,ab OR (Hereford:ti,ab AND Worcester:ti,ab) OR Hertfordshire:ti,ab OR Herefordshire:ti,ab OR Humberside:ti,ab OR Huntingdon:ti,ab OR Huntingdonshire:ti,ab OR 'Isle of Wight':ti,ab OR Kent:ti,ab OR Lancashire:ti,ab OR Leicestershire:ti,ab OR Lincolnshire:ti,ab OR London:ti,ab OR Manchester:ti,ab OR Merseyside:ti,ab OR Middlesex:ti,ab OR Norfolk:ti,ab OR Northamptonshire:ti,ab OR Northumberland:ti,ab 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 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 Aontroim:ti,ab OR 'Contae Aontroma':ti,ab OR Anthrim:ti,ab OR Antrìm: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 Fermanay:ti,ab OR Londonderry:ti,ab OR Doire:ti,ab OR Dhoire:ti,ab OR Lunnonderrie: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 'Icelander'/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 Vestfirdir:ti,ab OR Westfjords:ti,ab OR Nordurland:ti,ab OR Austurland:ti,ab OR Sudurland:ti,ab OR Kopavogur:ti,ab OR Hafnarfjordur: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 Herzegonine: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 'Zenickho 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 Hercegbosanska:ti,ab OR 'Unsko sanski':ti,ab OR 'Una Sana':ti,ab OR 'Banja Luka':ti,ab OR bijeljina:ti,ab OR Mostar:ti,ab OR Prijedor:ti,ab OR Cazin:ti,ab OR Doboj:ti,ab OR Zupanija: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 Gjilan*: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 Prizren:ti,ab OR Prizeni:ti,ab OR Produjev*:ti,ab OR Vucitrn: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 Dukagjinit:ti,ab OR 'Liechtenstein'/exp OR Liechtenstein:ti,ab OR Lienchtensteiner*: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 Norgga: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 Romssa: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 Tromso:ti,ab OR Sarpsborg:ti,ab OR europe*:ad OR europa*:ad OR eu:ad OR eea:ad OR efta:ad OR 'eu/eea':ad OR 'eu/efta':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 NEXT/1 (countr* OR state*)):ad OR danubian:ad OR 'iberian peninsula':ad OR 'peninsula iberica':ad OR 'péninsule ibérique':ad OR 'iberiar penintsula':ad OR iberia:ad OR anatolia:ad OR anadolu:ad OR anatole:ad OR anatolian:ad OR yugoslavia: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 (visegrád:ad AND (group:ad OR four:ad OR triangle:ad)) OR 'visegrádská čtyřka':ad OR 'visegrádská skupina':ad OR 'visegrádi együttműködés':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 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 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 Schaerbeek:ad OR Schaarbeek:ad OR Anderlecht:ad OR Leuven:ad OR Louvain: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 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 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 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 'brodsko posavska':ad OR 'dubrovnik neretva':ad OR 'dubrovacko neretvanska':ad OR zagreb:ad OR zagrebacka:ad OR istria:ad OR istarska:ad OR karlovacka: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 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 lakadamya:ad OR 'kato polemidia':ad OR 'kato polemidhia':ad OR aglandjia:ad OR eglence: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 prague: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 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 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 Sjaelland: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 Kobenhavn: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 Storstrøm: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 Estonia*:ad OR Eesti:ad OR Eestlased:ad OR Eestlane:ad OR Harju:ad OR Harjumaa:ad OR Hiiu:ad OR Hiiumaa:ad OR 'Ida Viru':ad OR 'Ida Virumaa':ad OR Jarvamaa:ad OR Jarva:ad OR Jogevamaa: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 '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 Aland:ad OR Ahvenanmaa:ad OR Uusimaa:ad OR Nyland:ad OR Karelia:ad OR Karjala:ad OR Karelen: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 Lappland:ad OR 'Paijat 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 Vantaa:ad OR Vanda:ad OR Oulu:ad OR Uleaborg:ad OR Turku:ad OR Abo:ad OR Jyvaskyla:ad OR Kuopio:ad OR Lahti:ad OR Lahtis:ad OR Kouvola: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 Aguiéne:ad OR Auvergne:ad OR Auvèrnhe:ad OR Auvèrnha:ad OR Normandie:ad OR Normandy:ad OR Normaundie:ad OR Bourgogne:ad OR Burgundy:ad OR Bregogne:ad OR Borgoégne:ad OR Borgogne:ad OR Brittany:ad OR Breizh:ad OR Bertaèyn: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 'Miègjorn Pirenèus':ad OR 'Mieidia Pirenèus':ad OR 'Mediodia Pirineos':ad OR 'Pays de la Loire':ad OR 'Broioù al Liger':ad OR Picardie:ad 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 '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 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 'Ille 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 Marne:ad OR Mayenne:ad OR Mayotte:ad OR 'Meurthe et Moselle':ad OR Meuse:ad OR Morbihan:ad OR Moselle:ad OR (Nord NEAR/3 (department 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 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 Göttingen: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 Hessia: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 Thueringen: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 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 'Periféreia Ipeírou':ad OR 'North aegean':ad OR 'Northern Aegean':ad OR 'Aegean islands':ad OR 'Aegean island':ad OR 'Nisoi Agaiou':ad OR 'Notio Aigaio':ad OR Peloponnese:ad OR Peloponniso*:ad OR Thessaly:ad OR Thessalia:ad OR Thessalian:ad OR Petthalia:ad OR 'Voreio Aigaio':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 Heraclion: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 Hungar*:ad OR Magyarorszag:ad OR Magyar*:ad OR Dunantuli:ad OR Transdanubia:ad OR Dunantul:ad OR 'Great Plain':ad OR 'Eszak Alfold':ad OR 'Del Alfold':ad OR 'Alfold es eszak':ad OR 'Northern Alfold':ad OR 'North Alfold':ad OR 'South Alfold':ad OR 'Southern Alfold':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 gyor: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 NEXT/3 (megye 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 Gyor:ad OR Nyiregyhaza:ad OR Kecskemet:ad OR Szekesfehervar:ad OR Szombathely: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 Muineachán:ad OR Mhuineacháin: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 Chorcai:ad OR Kerry:ad OR Ciarrai:ad OR Chiarrai: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 Clar':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 'Dhún na nGall':ad OR Dinnygal:ad OR Dunnyga:ad OR Leinster:ad OR Laighin:ad OR 'Cúige Laighean':ad OR Munster:ad OR Mumhain:ad OR 'Cúige Mumhan':ad OR Connacht:ad OR Connachta:ad OR Drogheda:ad OR 'Droichead Atha':ad OR Dundalk:ad OR 'Dún Dealgan':ad OR Swords:ad OR Sord:ad OR Bray:ad OR Bre:ad OR Navan:ad OR 'An Uaimh':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 '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 Latvi*:ad OR Riga:ad OR Courland:ad OR Kurzeme:ad OR Kurland:ad OR Latgale:ad OR Lettgallia:ad OR Latgola:ad OR Latgalia:ad OR Vidzeme:ad OR Vidumo:ad OR Semigallia: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 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 Klaipedos:ad OR Marijampoles:ad OR Marijampole:ad OR Panevezys:ad OR Panevezio:ad OR Siauliai:ad OR Siauliu: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 Luxembourg*:ad OR Luxemburg: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 Düdelingen:ad OR Duedelingen:ad OR Schifflange:ad OR Scheffleng:ad OR Schifflingen: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 Malta:ad OR Maltese*:ad OR Maltin:ad OR Gozo:ad OR Ghawdex:ad OR Valletta:ad OR 'Ill Belt':ad OR Birkirkara:ad OR 'B Kara':ad OR Birchircara: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 Nimeguen: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 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 'Varmia Mazuria':ad OR 'Varmian Mazurian':ad OR 'Varmia Masuria':ad OR 'Varmian 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 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 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 (Agualva:ad AND Cacem:ad) OR Romania*:ad OR Rumania*:ad OR Roumania*:ad OR Romani:ad OR Rumani: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 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 Posonium:ad OR Banskobystri*:ad OR 'Banska Bystrica':ad OR Neusohl:ad OR Besztercebánya: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 Trentschin:ad OR Trencsén:ad OR Zilina:ad OR Sillein:ad OR Zsolna:ad OR Zylina:ad OR (Martin:ad AND (city:ad OR Svaty:ad)) OR Turócszentmárton:ad 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 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 Laibach: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 Neustadtl:ad OR Domzale:ad OR Velenje:ad OR Wollan:ad OR Woellan:ad OR

'Nova Gorica':ad OR Kamnik:ad OR Spain:ad OR Espana:ad OR Spanish:ad OR Espanol*:ad OR Spaniard*:ad OR Andalucia: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 Cataluna: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 Baleares:ad OR 'La Rioja':ad OR 'Pais Vasco':ad OR 'Basque Country':ad OR 'Baske region':ad OR Euskadi:ad OR Asturias:ad OR Murcia:ad OR Coruna:ad OR Alava:ad OR Araba:ad OR Albacete:ad OR Alicante:ad OR Alacant:ad OR Almeria:ad OR Avila:ad OR Badajoz:ad OR Badajos: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 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 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 Malmo:ad OR Vasteras:ad OR Linkoping:ad OR Helsingborg:ad OR Halsingborg:ad OR Norrkoping:ad 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 Kirkcudbrightshire: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 Anthrim:ad OR Antrìm: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 Dún':ad OR 'an Dúin':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 Makedon*:ad OR Macedon*:ad OR Fyrom:ad OR Istocen:ad OR Severoistocen:ad OR Jugoistocen:ad OR Jugozapaden:ad OR Pelagonski:ad OR Pelagonia:ad OR Poloski:ad OR Polog:ad OR Skopski:ad OR Skopje:ad OR Ckonje:ad OR Vardar*:ad OR Bitola:ad OR Kumanovo:ad OR Prilep:ad OR Tetovo:ad OR Tetova:ad OR Tetove:ad OR Veles:ad OR Stip:ad OR Shtip:ad OR Ohrid:ad OR Gostivar:ad OR Gostivari:ad OR Strumica:ad OR Iceland:ad OR Icelandic*:ad OR islenska*:ad OR Icelander*:ad OR islendinga*:ad OR Islendigar:ad OR Inslenska:ad OR Reykjavík:ad OR Reykjavíkurborg:ad OR Hofudborgarsvaedi:ad OR Sudurnes:ad OR Vesturland:ad OR Vestfirdir: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 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 Zupanija: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 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 Sarpsborg:ad OR Gibraltar:ti,ab OR Gibraltar:ad OR Hebrid*:ti,ab OR Hebrid*:ad OR Svalbard*:ti,ab OR Svalbard*:ad

Inclusion and exclusion criteria

Table A-3. Inclusion and exclusion criteria on the topic testing

	Inclusion	Exclusion
Study design/type	• Randomised controlled trials (RCTs) • Non-randomised, prospective comparative studies • Prospective observational studies (e.g. cohort studies) • Retrospective observational studies (e.g. case-control studies) • Cross-sectional studies • Meta-analysis or systematic review (for hand search) • Conference abstracts	• Narrative review • Case reports • Non-pertinent publication types (e.g. expert opinions, letters to the editor, editorials, comments) • Animal studies • Genetic studies, biochemistry or molecular studies • Mathematical modelling studies • Studies on unlinked/anonymous testing to determine prevalence • Studies describing the sensitivity/specificity of laboratory tests
Country	• EU/EEA countries	• All other countries
Study subject	• Hepatitis B or C	• Other hepatitis
Study population	• General population, population subgroups possibly at risk	• Other populations
Specific outcomes of interest	• Description of approach • Acceptance/barriers to testing • Feasibility of testing intervention • Offer of test • Uptake and coverage of testing • Positivity rate/diagnosis rate • Changes in prevalence/incidence in population • Other outcomes relevant to assessing impact of interventions	• Outcomes not related to research questions

Table A-4. Reasons for exclusion of publications

Reasons for exclusion	
Studies relevant to wider search only, without outcomes on testing initiatives or interventions	46
Country out of scope	26
Data similar to more recent article (available)	8
Narrative review/other publication type	18
No data on objectives	66
Systematic review	14
Poor quality	1
Conference proceeding before 2015	103
Limited data available (conference proceeding)	1
Methods insufficient (conference proceeding)	4
Qualitative study (conference proceeding)	3
Total	**290**

Table A-5. Variables for data extraction

Variable	Description	Values
Reference		
Author	Surname of first author of the article	Surname
Year	Year of publication of the article	Year: yyyy
Study characteristics		
Country	Country for which the study report prevalence estimates	Country name
Period of sampling	Month/s and year/s during which study sampling was conducted	Month/s and year/s
Virus	Virus for which prevalence/incidence data are reported	HCV HBV both
Setting	Narrative field for relevant details of setting	Primary care Community Hospital Prison STI clinic Migrant clinic Other healthcare ANC Online Multiple Other
Level	Level at which the intervention or study is carried out	Clinic/site level City level Regional National EU/EEA wide NR

Variable	Description	Values
Study design	Design of reported study	Randomised controlled trial Non-randomised trial Prospective cohort Retrospective cohort Pre-post study Cross-sectional Qualitative Mixed methods Surveillance/evaluation/audit Other
Intervention	Does the study describe a testing intervention (e.g. novel tests, risk group testing, integrated testing and universal testing)?	Yes/No
Approach to improve testing	Narrative field for description of the approach used to improve HBV/HCV testing	
Data collection	Method by which data on relevant outcomes was collected	Questionnaire Clinical record database Laboratory data Interviews NR Several Other Medical records
Study population		
Population targeted for testing	Population subgroup sampled in the study	General population Drug users PWID Migrants MSM Prisoners Pregnant women Healthcare workers Public safety workers Waste workers Sex workers HIV+ HBV/HCV+ STI infected People having an STI test People engaging in high risk sexual behaviour Sexual assault victims Intranasal drug users Sexual contacts 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 contacts Birth cohort Travellers Underprivileged people Precarious individuals Psychiatric patients Refugees People having an HVB/HVC test People with polyarthritis People at high risk for HBV/HCV Students Patients receiving Rituximab People without healthcare coverage Several
Study population and setting description	Narrative field for any further relevant information on the study population and setting	
Denominator	Population at risk/that could be considered a candidate for testing	Numerical
Results		
% Offer	Proportion of participants who were offered HBV/HCV testing	%
% Accepting	Proportion of participants who accepted HBV/HCV testing of those who were offered HBV/HCV testing	%
% Uptake	Proportion of participants who were tested for HBV/HCV	%
Positivity rate	Proportion of participants who were HBV/HCV positive of those who were tested for HBV/HCV	%
% Newly diagnosed	Proportion of participants who were newly diagnosed with HBV/HCV of those who were tested for HBV/HCV	%
Feasibility and acceptability	Narrative field for relevant outcomes regarding the feasibility and acceptability of the testing intervention	

Variable	Description	Values
Other HBV/HCV testing outcomes	Narrative field for other relevant outcomes related to HBV/HCV testing	
General		
Conference proceedings	A paper presented at a conference and published in a volume called a conference proceeding	Yes/No
Quality assessment score	Quality score assessed using SIGN checklists	++/+/-
Quality assessment (studies without score)	Narrative field for aspects of quality assessment for studies for which formal assessment checklists are unavailable	Aspects in which the study diverged from the checklist [Table A-6]
General comments	Narrative field for relevant comments on the study or further interpretation of the data extraction and critical appraisal	

Quality assessment

Table A-6. Quality assessment checklist for studies which could not be assessed by other available checklists

Quality assessment checklist
The relevance and purpose of the research are clearly described
The methods used are clearly described and appropriate for the purpose of the research
The selection of the study population is adequate for the purpose of the research
Data collection is adequate for the purpose of the research
The theoretical background is clearly described
Data are analysed in depth
Results and conclusions are clearly described
The study population is clearly described, including where appropriate case detection and case definition
The population is representative of the source population
The denominator is chosen appropriately, e.g. in case of surveillance studies

Summary tables for evidence on hepatitis testing initiatives and interventions

Table A-7. Evidence base for the effectiveness of testing initiatives in primary healthcare settings

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
HBV							
Hargreaves, 2014 [1]	Country UK Study period 2013 Study design Surveillance/evaluation/audit	Testing offered to all new migrant patients. Intervention included awareness-raising educational sessions for GPs and practice staff	Migrants visiting two GP practices in a migrant area of west London	47 new migrants eligible	*Offered (%)* 100% *Uptake (%)* 70% *Positivity (%)* 0% *Acceptance rate (%)* 70%	Quality score NA No major comments	No comments
Roudot-Thoraval, 2015 [2]	Country France Study period May 2007-May 2014 Study design Surveillance/evaluation/audit	Coordinated programme offering testing to precarious individuals and access to care	Precarious adults attending two primary healthcare settings in Creteil	2,223	*Positivity (%)* 6.7% *Newly diagnosed (%)* 6.4%	Quality score NA No major comments	No comments
HCV							
Anderson, 2009 [3]	*Country* UK *Study period* Nov 2003-Apr 2004 *Study design* Non-randomised trial	Opportunistic, age criterion based HCV screening undertaken in one GP practice and compared with a similar practice where no intervention was undertaken	30-54 year old patients of two general practices in Glasgow	584 (intervention practice) NR (control practice)	*Offer* 72% (intervention) 0% (control) *Uptake* 20% (intervention) 0% (control) *Positivity* 13% (intervention)	Quality score Acceptable No major comments	Set in a socio-economically deprived area of Glasgow with high HCV and IDU prevalence

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Parisi, 2014 [4]	*Country* Italy *Study period* Jan 2011 - Apr 2014 *Study design* Surveillance/evaluation/audit	A Prevention Program called 'EASY test project' using two new oral tests to diagnose the HCV and HIV infection.	People aged >18 years, unaware of their HCV serological status and able to complete the questionnaire in Italian or English who attented two Points-of-care and one HIV-STDs public prevention outpatient clinic ('FreeDay Easy') of the Infectious Diseases Department of San Raffaele Scientific Institute in Milan and extended to six general practitioner surgeries.	29,600 (total) 14000 (2011) 10000 (2012) 5000 (2013) 600 (2014)	*Uptake (%)* 15.2% (total) 9.1% (2011) 14% (2012) 16.9% (2013) 22% (2014) *Positivity (%)* 0.6% (total) 0.5% (2011) 0.5% (2011) 0.4% (2013) 4.5% (2014)	*Quality score* NA No major comments	No comments
Helsper, 2010 [5]	*Country* Netherlands *Study period* Campaign: Oct 2007 - Jan 2008 Before campaign: Oct 2005 - Jan 2006 & Oct 2006 - Jan 2007 *Study design* Non-randomised trial	A public HCV campaign consisting of radio and newspaper ads and information material distributed at public places, all aiming at increasing public awareness of Hep C and stimulating those at increased risk of HCV infection to consult their GP or the regional Public Health Service for testing and, if positive, referral for treatment. In the **intervention** region, an additional support for primary care was provided by means of brochures, short courses and informative visits.	All primary care practices of GPs who were not related to shelters for drug and alcohol addicts, in two regions in the Netherlands (Intervention: Amersfoort region with 110 GP practices. **Control:** Apeldoorn region with 109 GP practices)	57 (intervention 2005/2006) 172 (intervention 2007) 86 (control 2005/2006) 118 (control 2007) Intervention proportional increase: 3.02 Control proportional increase: 1.36 OR 2.2 (95% CI 1.5-3.3)	*Positivity (%)* 0% (intervention 2005/2006) 1.7% (intervention 2007) 1.7% (control 2005/2006) 0.8% (control 2007) Intervention increase 1.7% (95% CI -0.2% - 3.7%) Control: decrease 0.9% (95% CI -4.1% - 2.3%) Difference: 2.6% (95% CI -0.7% - 5.8%)	*Quality score* low No major comments	No baseline characteristics table and therefore don't know if groups are comparable
McLeod, 2014 [6]	*Country* UK *Study period* Jan 1999 - Dec 2011 *Study design* Pre-post study	Surveillance study on HCV testing examining impact of the Hepatitis C Action Plan consisting of awareness-raising activities, for GPs and those at risk, and the introduction of DBS sampling in community drug services to overcome barriers to testing.	Data on anti-HCV tests provided by the West of Scotland Specialist Virology Centre; East of Scotland Specialist Virology Centre; Department of Medical Microbiology at Aberdeen Royal Infirmary and Ninewells Hospital & Medical School. Positive results were laboratory confirmed.	93,954 (total) 5,421 (pre-Action Plan) 10,117 (Action Plan)	*Positivity (%)* 9% (total) 9.9% (pre-Action Plan) 7.9% (Action Plan)	*Quality score* NA No major comments	RR also reported for initial trend, level change in number tested and change in trend over each setting
Lambert, 2016 [7]	*Country* Ireland *Study period* NR *Study design* Surveillance/evaluation/audit	Audit of HCV testing using the OraQuick. In addition interviews with selected patients exploring the reasons they were lost to follow up after initial diagnosis.	A cohort of homeless people accessing the Safetynet primary healthcare services in Dublin, Ireland	460	*Positivity (%)* 0,26% *Newly diagnosed (%)* 9.6%	*Quality score* NA No major comments	No comments
Hargreaves, 2014 [1]	*Country* UK *Study period* 2013 *Study design* Surveillance/evaluation/audit	Testing offered to all new migrant patients. Intervention included awareness-raising educational sessions for GPs and practice staff	Migrants visiting two GP practices in a migrant area of west London	47 new migrants eligible	*Offered (%)* 100% *Uptake (%)* 70% *Positivity (%)* 0% *Acceptance rate (%)* 70%	*Quality score* NA No major comments	

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Cullen, 2012 [8]	*Country* UK *Study period* Feb 2007 –Oct 2007 *Study design* Non-randomised trial	A targeted screening intervention and GP-based case finding initiative offering HCV testing to IDUs. Eligible persons were informed of the intervention, provided with information leaflets, and offered testing by their GP/practice nurse. Training was offered to practices.	Chronically HCV-infected former intravenous drug users (IDUs) who were aged 30–54 years and had indicators of past IDU (i.e. had ceased injecting at least 6 months prior to the intervention), attending eight general practices in Greater Glasgow and Clyde (GGC) NHS Board area exposed to the intervention and those attending an equivalent number of demographically comparable control practices.	13037 practice population (intervention) 485 eligible (intervention) 422 attending (intervention) 14189 practice population (control)	*Offered (%)* 52% (range: 5%-88%) intervention Uptake (%) 24.8% intervention 86% (of those accepting) intervention 0.3% control *Positivity (%)* 70% intervention 40.9% (PCR positive) intervention 22% control 14% (PCR positive) control *Newly diagnosed (%)* 71.6% *Acceptance rate (%)* 56%-76.7% All interviewed participants (n=23) responded positively about the acceptability, none were offended by testing offer. Staff interviewed (n=9) viewed the intervention as an opportunity to facilitate identification, and subsequent referral	*Quality score* low No major comments	Denominator for control group not clear. The study focused on practises in areas of high deprivation, of which not many were willing to participate. This meant that randomisation was not feasible.
Both HBV/HCV or not specified							
Kunkel, 2015 [9]	*Country* UK *Study period* NR *Study design* Surveillance/evaluation/audit	A pilot study (HEPScreen Project) of GP-based testing for viral hepatitis in East London. Patients were invited to attend practice for testing. Half of the patients were additionally invited for HIV testing to investigate the influence on uptake.	Registers of two GP practices in East London were screened for migrants at risk of viral hepatitis. African, South Asian and Turkish patients were selected as 'at-risk' ethnicities. Patients were included if they were aged 18 and over, had registered with the GP in the last 5 years and did not have known infection with HBV or HCV.	560 (Total) 200 (African) 170 (South Asian) 190 (Turkish)	*Uptake (%)* 2.3% (Total) 3% (African) 1.7% (South Asian) 2.1% (Turkish) *Positivity (%)* 0%	*Quality score* NA No major comments	The pilot was stopped prematurely due to insufficient uptake. This prevented a formal analysis of the benefit or harm of including HIV testing in the program.

Table A-8. Evidence base for the effectiveness of testing initiatives in hospital settings

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Emergency department only							
HBV							
O'Connell 2016 [10]	*Country* Ireland *Study period* March 2014 - Jan 2015 *Study design* Surveillance/evaluation/audit	Opt-out BBV screening programme consisting of an extra serum sample taken when undergoing phlebotomy as part of routine clinical care at no extra cost	All patients over the age of 18 with the capacity to consent, who had bloods taken as part of routine clinical care at a large urban Emergency Department in Dublin, Ireland	10000	*Uptake (%)* 88.4% *Positivity (%)* 0.5% *Newly diagnosed (%)* 0.2%	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Orkin, 2016 [11]	*Country* UK *Study period* 13-19 October 2014 *Study design* Surveillance/evaluation/audit	Routine opt-out testing offered for BBVs in Emergency department ('Going viral' campaign)	Adult emergency department attendees who had blood taken at nine emergency departments with HIV prevalence exceeding 2/1000, in London, Essex, Leeds and Glasgow	7807	*Uptake (%)* 27% *Positivity (%)* 0.7% *Newly diagnosed (%)* 0.5%	*Quality score* NA Sample may not be representative of study population	- Uptake varied among emergency departments; some sites that tested larger numbers are overrepresented in results. - Five of the nine centres were in central London, making the results most applicable to inner London - It was not possible to distinguish between test not offered and refusal to test.
HCV							
O'Connell, 2016 [10]	*Country* Ireland *Study period* March 2014 - Jan 2015 *Study design* Surveillance/evaluation/audit	Opt-out BBV screening programme consisting of an extra serum sample taken when undergoing phlebotomy as part of routine clinical care at no extra cost	All patients over the age of 18 with the capacity to consent, who had bloods taken as part of routine clinical care at a large urban Emergency Department in Dublin, Ireland	10000	*Uptake (%)* 88.4% *Positivity (%)* 0,05% *Newly diagnosed (%)* 0.6%	*Quality score* NA No major comments	No comments
Orkin, 2016 [11]	*Country* UK *Study period* 13-19 October 2015 *Study design* Surveillance/evaluation/audit	Routine opt-out testing offered for BBVs in Emergency department ('Going viral' campaign)	Adult emergency department attendees who had blood taken at nine emergency departments with HIV prevalence exceeding 2/1000, in London, Essex, Leeds and Glasgow	7807	*Uptake (%)* 27% *Positivity (%)* 1.8% *Newly diagnosed (%)* 0.7%	*Quality score* NA Sample may not be representative of study population	- Uptake varied among emergency departments; some sites that tested larger numbers are overrepresented in results. - Five of the nine centres were in central London, making the results most applicable to inner London - It was not possible to distinguish between test not offered and refusal to test.
Other hospital departments							
HBV							
Aparicio, 2012 [12]	*Country* France *Study period* 8 March-9 April 2010 *Study design* Surveillance/evaluation/audit	Targeted BBV screening for patients coming from high prevalence regions	Adult patients from sub-Saharan Africa, French Indies and French Guiana, consulting for a medical issue, dressing or blood sample in the outpatients department of Lariboisiere hospital in Paris	272	*Offered (%)* 100% *Uptake (%)* 61% *Positivity (%)* 7.8%	*Quality score* NA No major comments	Article in French
Richter, 2014 [13]	*Country* Netherlands *Study period* January 2011 *Study design* Surveillance/evaluation/audit	A screening project, involving a campaigning phase with posters and flyers and a website. FGMs received a personal invitation for an educational meeting with free onsite serological screening	FGMs aged >18 years from Afghanistan, Iran, Iraq, the former Soviet Republics and Vietnam living in Arnhem and Rheden invited to three different locations of Rijnstate Hospital	3,226 registered FGM	*Offered (%)* 100% *Uptake (%)* 28.7% *Positivity (%)* 2.2%	*Quality score* NA No major comments	No comments
Sanger, 2013 [14]	*Country* UK *Study period* 12 mo period *Study design* Surveillance/evaluation/audit	A service improvement project, offering BBV tests.	Patients with severe mental illness in a central London psychiatric hospital (three open admission wards and one intensive care unit).	105	*Offered (%)* 83% had mental capacity to make informed decision *Uptake (%)* 54% *Positivity (%)* 7.0% *Newly diagnosed (%)* 7.0% *Acceptance rate (%)* 66%	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
HCV							
Parisi, 2014 [4]	*Country* Italy *Study period* Jan 2011 - Apr 2014 *Study design* Surveillance/evaluation/audit	A Prevention Program called 'EASY test project' using two new oral tests to diagnose the HCV and HIV infection.	People aged >18 years, unaware of their HCV serological status and able to complete the questionnaire in Italian or English who attended two Points-of-care and one HIV-STDs public prevention outpatient clinic ('FreeDay Easy') of the Infectious Diseases Department of San Raffaele Scientific Institute in Milan and extended to six general practitioner surgeries.	29,600 (total) 14,000 (2011) 10,000 (2012) 5,000 (2013) 600 (2014)	*Uptake (%)* 15.2% (total) 9.1% (2011) 14% (2012) 16.9% (2013) 22% (2014) *Positivity (%)* 0.6% (total) 0.5% (2011) 0.5% (2011) 0.4% (2013) 4.5% (2014)	*Quality score* NA No major comments	No comments
McLeod, 2014 [6]	*Country* UK *Study period* Jan 1999 - Dec 2011 *Study design* Pre-post study	Surveillance study on HCV testing examining impact of the Hepatitis C Action Plan consisting of awareness-raising activities, for GPs and those at risk, and the introduction of DBS sampling in community drug services to overcome barriers to testing.	Data on anti-HCV tests provided by the West of Scotland Specialist Virology Centre; East of Scotland Specialist Virology Centre; Department of Medical Microbiology at Aberdeen Royal Infirmary and Ninewells Hospital & Medical School. Positive results were laboratory confirmed.	145,140(total) 10,536 (pre-Action Plan) 12,170 (Action Plan)	*Positivity (%)* 35.5% (total) 44.4% (pre-Action Plan) 27.0% (Action Plan)	*Quality score* NA No major comments	RR also reported for initial trend, level change in number tested and change in trend over each setting
Aparicio, 2012 [12]	*Country* France *Study period* 8 March-9 April 2010 *Study design* Surveillance/evaluation/audit	Targeted BBV screening for patients coming from high prevalence regions	Adult patients from sub-Saharan Africa, French Indies and French Guiana, consulting for a medical issue, dressing or blood sample in the outpatients department of Lariboisiere hospital in Paris	272	*Offered (%)* 100% *Uptake (%)* 61% *Positivity (%)* 3.6%	*Quality score* NA No major comments	Article in French
Richter, 2014 [13]	*Country* Netherlands *Study period* January 2011 *Study design* Surveillance/evaluation/audit	A screening project, involving a campaigning phase with posters and flyers and a website. FGMs received a personal invitation for an educational meeting with free onsite serological screening	FGMs aged >18 years from Afghanistan, Iran, Iraq, the former Soviet Republics and Vietnam living in Arnhem and Rheden invited to three different locations of Rijnstate Hospital	3,226 registered FGM	*Offered (%)* 100% *Uptake (%)* 28.7% *Positivity (%)* 0.3% <0.1% (HCV-RNA)	*Quality score* NA No major comments	No comments
Sanger, 2013 [14]	*Country* UK *Study period* 12 mo period *Study design* Surveillance/evaluation/audit	A service improvement project, offering BBV tests.	Patients with severe mental illness in a central London psychiatric hospital (three open admission wards and one intensive care unit).	105	*Offered (%)* 83% had mental capacity to make informed decision *Uptake (%)* 54% *Positivity (%)* 8.7% *Acceptance rate (%)* 66%	*Quality score* NA No major comments	No comments

Table A-9. Evidence base for the effectiveness of testing initiatives in other healthcare settings

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Antenatal services							
HBV							
Keel, 2016 [15]	Country UK Study period Baseline retrospective review: 1 Jan 2009 - 31 Dec 2009 Prospective intervention period: 1 Nov 2010 - 31 Dec 2011 Study design Non-randomised trial	During the baseline period, a retrospective review was carried out of GP records of pregnant women identified through the Enhanced Surveillance of Antenatal Hepatitis B database. The relevant GP was sent a letter explaining the purpose of the review and a questionnaire requesting further information on the case and their household contacts. North Middlesex acted as the prospective intervention arm and Newham acted as the prospective comparison arm where service provision remained unchanged from the baseline review period. In the intervention group, women whose household contacts were eligible for home DBS testing were identified by weekly meetings. DBS testing and questionnaire were collected.	Household contacts of all HBsAg-positive pregnant women identified through antenatal screening at two maternity units in London that were selected based on their high antenatal HBV prevalence (North Middlesex and Newham hospitals) during the review and intervention periods. HBsAg-positive pregnant women were excluded if (a) they were known to be positive prior to antenatal screening and their families had been tested and vaccinated appropriately; or (b) their care was transferred to a trust not participating in the intervention.	Number of households: Middlesex retrospective: 41 (71.9% of pregnant women) Middlesex prospective intervention: 58 (100% of pregnant women) Newham retrospective: 91 (73.4% of pregnant women) Newham prospective control: 68 (55.7% of pregnant women) Relationship: child; partner; other adult Middlesex retrospective: 54; 33; 4 Middlesex prospective intervention: 90; 56; 23 Newham retrospective: 65; 81; 24 Newham prospective control: 63; 39; 59	*Uptake (%)* Any household tested: Middlesex retrospective: 62.1% Middlesex prospective intervention: 96.6% Newham retrospective: 39.6% Newham prospective control: 39.4% Relationship: child; partner; other adult Middlesex retrospective: 57.4%; 30.3%; 25% Middlesex prospective intervention: 100%; 96.4%; 100% Newham retrospective: 64.6%; 29.6%; 25% Newham prospective control: 31.7%; 23.1%; 30.5% *Positivity (%)* Current infection: Total: (relationship: child; partner; other adult) 2.9%; 10.0%; 10.9% Relationship: child; partner; other adult Middlesex retrospective: 0%; 3%; 0% Middlesex prospective intervention: 3.3%; 21.4%; 21.7% Newham retrospective: 6.2%; 7.4%; 8.3% Newham prospective control: 1.6%; 5.1%; 8.5%	*Quality score* Acceptable No major comments	Denominator differs
HCV							
Diab-Elschahawi, 2013 [16]	*Country* Austria *Study period* 1 July 2007 - 28 Feb 2011 *Study design* Pre-post study	Comparison of a targeted screening approach vs universal screening. During the first 22 months of the study a targeted HCV screening approach was adopted. Universal screening was implemented for the following 22 months.	Pregnant women presenting for antenatal care at the Vienna University Hospital (tertiary-care medical university hospital), Vienna, Austria	4,369 (targeted screening); 4,222 (universal screening)	*Uptake (%)* 28.3% (targeted screening) *Positivity (%)* 1.3% (targeted screening); 1.7% (universal screening)	*Quality score* NA No major comments	The population of pregnant women is mostly patients at risk for pregnancy-related complications, including those enrolled in opiate maintenance therapy programs

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Clinic for precarious individuals							
HBV							
Pauti, 2009 [17]	*Country* France *Study period* 2007 *Study design* Surveillance/evaluation/audit	Systematic screening for all new patients as part of the 'Doctors of the World France mission' facilitating access to care for vulnerable populations. The project includes staff training, organisation of multidisciplinary teams, individual prevention interviews conducted with patients prior to consultations (at Saint-Denis; in Paris, awareness information was provided in the waiting room) and use of interpreters.	All new patients (mainly immigrants) attending two Reception Centres for Care and Orientation (RCCO) in Saint-Denis and Paris	1205 tests performed	*Uptake (%)* At Saint-Denis RCCO: 90% when screening is proposed during a prevention interview; 71% without interview. *Positivity (%)* 6.9%	*Quality score* NA Methods and results were not clearly described	- 90% of study population were immigrants - Before October 2007, no free interpretation was provided and this meant that mainly French-speaking subjects were reached - Methods and results were often vague, it is not clear why only some results are shown for certain centres
HCV							
Pauti, 2009 [17]	*Country* France *Study period* 2007 *Study design* Surveillance/evaluation/audit	Systematic screening for all new patients as part of the 'Doctors of the World France mission' facilitating access to care for vulnerable populations. The project includes staff training, organisation of multidisciplinary teams, individual prevention interviews conducted with patients prior to consultations (at Saint-Denis; in Paris, awareness information was provided in the waiting room) and use of interpreters.	All new patients (mainly immigrants) attending two Reception Centres for Care and Orientation (RCCO) in Saint-Denis and Paris	1205 tests performed	Uptake (%) At Saint-Denis RCCO: 90% when screening is proposed during a prevention interview; 71% without interview. Positivity (%) 5.8%	*Quality score* NA Methods and results were not clearly described	- 90% of study population were immigrants - Before October 2007, no free interpretation was provided and this meant that mainly French-speaking subjects were reached - Methods and results were often vague, it is not clear why only some results are shown for certain centres
Drug services							
HBV							
Schreuder, 2010 [18]	*Country* Netherlands *Study period* 2004 - 2008 (Amsterdam) 2003 -2009 (Heerlen) *Study design* Surveillance/evaluation/audit	Voluntary screening for infectious diseases at methadone posts	Opioid drug users (ODU) attending methadone posts in Amsterdam and Heerlen, the Netherlands	2024 (Amsterdam) 287 (Heerlen)	*Uptake (%)* 34% (680/2024)(Amsterdam) 69% (197/287)(Heerlen) *Positivity (%)* 33% (anti-HBc Amsterdam) 48% (anti-HBc Heerlen) Newly diagnosed (%)	*Quality score* NA No major comments	No comments
HCV							
Arain, 2016 [19]	*Country* Belgium *Study period* Feb 2014 - Dec 2014 *Study design* RCT	Pilot study combining formal education, peer education and FibroScan assessment. The participants were randomized into two groups: the control group, who received the current standard of care (the availability of information brochures in the waiting room was announced), and the intervention group, who received an information session (1 hour meeting with PowerPoint presentation, followed by additional information from peers over personal experiences of treatment) followed by a FibroScan at a hospital (transport provided).	Persons who use drugs age ≥18 years with a history of substance use and attending opioid substitution treatment programme at the Centre for Alcohol and other Drug problems located in Limburg, Belgium (comprised of former and current substance users).	52 (27 control 25 intervention) 17 completed all questionnaires	*Uptake (%)* 7% (2/27) control 20% (5/25) intervention	*Quality score* acceptable No major comments	The study was single blind, as it was impossible to blind the research team due to the researcher's involvement in the information session and its coordination.

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Lindenburg, 2011 [20]	*Country* Netherlands *Study period* Jan 2005 - Apr 2007 *Study design* Surveillance/evaluation/audit	Drug Users Treatment for Chronic Hepatitis-C (DUTCH-C) project offering HCV screening and treatment in a multidisciplinary unit established for this purpose, including ACS medical staff, a liver specialist, a psychiatrist, and a virologist from the Amsterdam Medical Center (AMC) and addiction specialists and case-load managers from methadone clinics.	Active and former drug users (DU), injecting or not, participating in the Amsterdam Cohort Study (ACS), visiting from December 2004 the Public Health Service Amsterdam (PHSA) (population 1). In 2007 non-ACS DU, either been tested HCV positive before or were considered to have a high likelihood of being infected, referred from methadone clinics and other addiction clinics in Amsterdam, were also included (population 2).	497 (population 1) 81 (population 2)	*Uptake (%)* 90% (population 1) 98% (population 2) *Positivity (%)* 60% (overall) 54% (HIV- overall) 89% (HIV+ overall) Newly diagnosed (%)	*Quality score* NA Study population not clearly described	The study population is not clearly described - the text suggests that only people with a background of psychiatric co-morbidity and social problems are included, however from the data this does not appear to be the case
Schreuder, 2010 [18]	*Country* Netherlands *Study period* 2004 - 2008 (Amsterdam) 2003 -2009 (Heerlen) *Study design* Surveillance/evaluation/audit	Voluntary screening for infectious diseases at methadone posts	Opioid drug users (ODU) attending methadone posts in Amsterdam and Heerlen, the Netherlands	2566 (Amsterdam) 287 (Heerlen)	*Uptake (%)* 53% (1359/2566)(Amsterdam) 66% (190/287)(Heerlen) *Positivity (%)* 26% (Amsterdam) 61% (Heerlen) Newly diagnosed (%)	*Quality score* NA No major comments	No comments
Tait, 2013 [21]	*Country* UK *Study period* 2009-2011 *Study design* Surveillance/evaluation/audit	DBS testing offered to all individuals who accessed needle exchange (NEXC) or drug treatment services (DTS)	Drug users living in Tayside who accessed needle exchange (NEXC) or drug treatment services (DTS)	Tested: 1123 total 631 NEXC 492 DTC	*Uptake (%)* 84.2% 18.7% (follow-up test within 1 y after the first) *Positivity (%)* 31.2% total 27.5% NEXC 35.3% DTC *Newly diagnosed (%)* 22.6% total 22.4% NEXC 22.8% DTC	*Quality score* NA No major comments	No comments
Free clinics							
HBV							
Bottero, 2015 [22]	*Country* France *Study period* 25 Feb 2013 - 21 June 2013 *Study design* RCT	A randomized, prospective, pilot intervention trial (Optiscreen III study). Eligible participants were randomized to receive 1 of 2 testing interventions for HIV, HBV, and HCV infection: a standard serology-based test (S arm), where participants received a prescription for serology performed at an outside laboratory; or a point-of-care (POC) rapid test (RT arm).	Individuals seeking care at an inner city clinic for persons without healthcare coverage ('Médecins du Monde', Paris, France) were asked to participate if they were ≥18 years old and could be available for further medical follow-up testing at Hôpital Saint-Antoine (Paris, France), if necessary. Persons already followed for HIV, HBV, and/or HCV infection or persons whose HIV, HBV, and/or HCV test result from 3 months before inclusion was available were excluded.	162 (S arm) 162 (RT arm)	*Uptake (%)* 64.2% (S arm) 98.2% (RT arm) $p<0.001$ *Positivity (%)* 8.3% (95% CI 5.4%-12.2%) Total 9.6% S arm 8.1% RT arm *Patient indicators* Proportion who prefer rapid testing to standard serological tests: 76% Proportion who preferred serological tests vs. had no preference: 7% vs 17% Common reasons for preferring rapid tests: less stress with same-day results, more practical use. Reasons for preferring serological tests: able to perform several tests at once, felt that the test was more reliable/accurate or caused less anxiety. 6 rapid test failures and 6 patients unable to be tested due to over calloused finger tips. *Provider indicators* Proportion that said that rapid testing simplified their consultation: 50% Proportion that claimed it had no effect: 35% Proportion that stated that it became more complicated: 15%	*Quality score* high No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
HCV							
Bottero, 2015 [22]	*Country* France *Study period* 25 Feb 2013 - 21 June 2013 *Study design* RCT	A randomized, prospective, pilot intervention trial (The Optiscreen III study). Eligible participants were randomized to receive 1 of 2 testing interventions for HIV, HBV, and HCV infection: a standard serology-based test (S arm), where participants received a prescription for serology performed at an outside laboratory; or a Point-of-Care (POC) rapid test (RT arm).	Individuals seeking care at an inner city clinic for persons without healthcare coverage ('Médecins du Monde', Paris, France) were asked to participate if they were ≥18 years old and could be available for further medical follow-up testing at Hôpital Saint-Antoine (Paris, France), if necessary. Persons already followed for HIV, HBV, and/or HCV infection or persons whose HIV, HBV, and/or HCV test result from 3 months before inclusion was available were excluded.	162 (S arm) 162 (RT arm)	*Uptake (%)* 64.2% (S arm) 98.2% (RT arm) *p*<0.001 *Positivity (%)* 2.9% (95% CI 1.3% - 5.6%) Total 3.8% S arm 2.5% RT arm *Patient indicators* Proportion who prefer rapid testing to standard serological tests: 76% Proportion who preferred serological tests vs. had no preference: 7% vs 17% Common reasons for preferring rapid tests: less stress with same-day results, more practical use. Reasons for preferring serological tests: able to perform several tests at once, felt that the test was more reliable/accurate or caused less anxiety. 6 rapid test failures and 6 patients unable to be tested due to over calloused finger tips. *Provider indicators* Proportion that said that rapid testing simplified their consultation: 50% Proportion that claimed it had no effect: 35% Proportion that stated that it became more complicated: 15%	*Quality score* high No major comments	No comments
Migrant clinics							
HBV							
Nosotti, 2016 [23]	*Country* Italy *Study period* March 2013 - June 2014 *Study design* Surveillance/evaluation/audit	Blood HBV test and vaccination offered to immigrants.	Immigrants coming from different high and intermediate endemic areas accessing the Outpatient Clinic of National Institute for Health, Migration and Poverty.	516	*Uptake (%)* 87% *Positivity (%)* 7.7%	*Quality score* NA No major comments	No comments
El-Hamad, 2015 [24]	*Country* Italy *Study period* Jan 2006 - Apr 2010 *Study design* Surveillance/evaluation/audit	Point of care screening	All consecutive migrants who accessed the Service of International Medicine of Brescia's Local Health Authority, coming from non-EU and non-western countries and newly accessing the Service of International Medicine, aged more than 18 years, and able to give a written consent.	4,078	*Uptake (%)* 91.4% *Positivity (%)* 6.0% (HbsAg) 43.3% (HBcAb) 1.6% (HBeAg)	*Quality score* NA No major comments	No comments
HCV							
El-Hamad, 2015 [24]	*Country* Italy *Study period* Jan 2006 - Apr 2010 *Study design* Surveillance/evaluation/audit	Point of care screening	All consecutive migrants who accessed the Service of International Medicine of Brescia's Local Health Authority, coming from non-EU and non-western countries and newly accessing the Service of International Medicine, aged more than 18 years, and able to give a written consent.	4,078	*Uptake (%)* 90.8% *Positivity (%)* 3.6%	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Pharmacies							
HCV							
Radley, 2017 [25]	*Country* UK *Study period* Jan 2014 - Dec 2014 *Study design* Non-randomised trial	Comparison of non-randomly chosen intervention groups (DBST in ORT pharmacies) and control groups (HCV testing in any other setting) for access and uptake of DBST.	Population receiving opioid replacement therapy (ORT) attending six ORT pharmacies offering dried blood spot testing (DBST) in the intervention group and ORT service users accessing HCV testing from 36 community ORT pharmacies (which did not offer DBST) in the city of Dundee, Scotland. Pharmacies were selected if they provided OST supervision for at least 30 patients and staff was willing to participate.	143 (intervention) 561 (control)	*Uptake (%)* 30% (43/143)(intervention) 13% (75/561) (control) OR: 2.25 (95% CI 1.48 - 3.42) *Patient indicators* Pharmacies found to be good place to be tested, positive relationships built with staff. Pharmacies viewed as part of the local community. Some suspicious when offered testing due to previous experience of discrimination at pharmacy. Some clients wished for better explanation of how DBS test worked *Provider indicators* Strong leadership, team involvement important for success of pharmacy DBS testing. Initial anxieties about contact with blood and concerns about workload. DBST was found to be simple to perform	*Quality score* acceptable No major comments	No comments
Radley, 2017 [26]	*Country* UK *Study period* Nov 2015-Sept 2016 *Study design* RCT	RCT evaluating uptake of DBS testing and treatment in a conventional care pathway vs. Pharmacist-led pathway. - Conventional care pathway: the pharmacist opportunistically discussed HCV testing with patients and performed DBS if the patient consented and had no recent test. Patients testing positive were invited to attend a clinic where standard care was carried out. - Pharmacist-led pathway: Identical to conventional, but patients testing positive were assessed by the pharmacist for treatment. If suitable, patients received treatment daily at the same time as their OST.	Patients prescribed opioid substitution therapy (OST) at eight pharmacies within the Tayside region of Scotland	244 (conventional pathway); 262 (pharmacist-led pathway)	*Uptake (%)* 24% (58/244) (conventional) 36% (94/262) (pharmacist-led) *Positivity (%)* 25.9% (conventional) 26.5% (pharmacist-led)	*Quality score* acceptable No major comments	Need to attend for off-site phlebotomy for confirmation led to some loss of potential patients in the pharmacist-led pathway
Prisons							
HBV							
Patel, 2016 [27]	*Country* UK *Study period* NR *Study design* Surveillance/evaluation/audit	A walk-in blood spot service advertised and provided to prisoners	Prisoners at one medium security prison	160 male prisoners tested	*Positivity (%)* 0% 1.3% anti-HBc+	*Quality score* NA No major comments	No comments
Sagnelli, 2012 [28]	*Country* Italy *Study period* NR *Study design* Surveillance/evaluation/audit	Screening project based on a peer-to-peer communication, followed by a month of blood sampling (on a voluntary basis) to test for HCV, HBV, HIV, Syphilis and Latent Tuberculosis.	Prisoners of 9 Italian prisons	3,468	*Uptake (%)* 65.3% *Positivity (%)* 4.4% *Newly diagnosed (%)* 1.5%	*Quality score* NA Method section is limited	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
HCV							
McLeod, 2014 [6]	*Country* UK *Study period* Jan 1999 - Dec 2011 *Study design* Pre-post study	Surveillance study on HCV testing examining impact of the Hepatitis C Action Plan consisting of awareness-raising activities, for GPs and those at risk, and the introduction of DBS sampling in community drug services to overcome barriers to testing.	Data on anti-HCV tests provided by the West of Scotland Specialist Virology Centre; East of Scotland Specialist Virology Centre; Department of Medical Microbiology at Aberdeen Royal Infirmary and Ninewells Hospital & Medical School. Positive results were laboratory confirmed.	4,200 (total) 257 (pre-Action Plan) 429 (Action Plan)	*Positivity (%)* 4.2% (total) 5.2% (pre-Action Plan) 3.5% (Action Plan)	*Quality score* NA No major comments	RR also reported for initial trend, level change in number tested and change in trend over each setting
Sagnelli, 2012 [28]	*Country* Italy *Study period* NR *Study design* Surveillance/evaluation/audit	Screening project based on a peer-to-peer communication, followed by a month of blood sampling (on a voluntary basis) to test for HCV, HBV, HIV, Syphilis and Latent Tuberculosis.	Prisoners of 9 Italian prisons	3,468	*Uptake (%)* 64.6% *Positivity (%)* 22.8% *Newly diagnosed (%)* 1.5%	*Quality score* NA Method section is limited	No comments
Patel, 2016 [27]	*Country* UK *Study period* NR *Study design* Surveillance/evaluation/audit	A walk-in blood spot service advertised and provided to prisoners	Prisoners at one medium security prison	160 male prisoners tested	*Positivity (%)* 33.8% 23.8% HCV-RNA+	*Quality score* NA No major comments	No comments
Craine, 2015 [29]	*Country* UK *Study period* March 2011 - Sept 2012 *Study design* RCT	A stepped wedge cluster RCT design with the intervention being randomized by start date. The intervention was the offer of DBST for HCV to prisoners.	All prisoners, able to give informed consent for diagnostic testing, of five UK prisons (4/5 prisons never implemented routine HCV testing and 1 prison carried out routine HCV testing services (venepuncture) before the study)	≈ 3,600	ORs for effect of the intervention on testing rate: Intention to treat (ITT): date is set as planned Actual intervention: the date it occurred OR: 0.84; 95% CI: 0.68-1.03; P=0.088 (ITT) OR: 0.86; 95% CI: 0.71-1.06; P=0.153 (Actual interventions) OR: 0.77; 95% CI: 0.53-1.13; P=0.157 (ITT pooled results of 5 imputations) OR: 0.80; 95% CI: 0.55-1.15; P=0.192 (Actual interventions pooled results of 5 imputations)	*Quality score* acceptable No major comments	Article presents figure with total test rate over time with fitted LOESS curve for each prison and for all five prisons.
Specialist services							
HCV							
McAllister, 2014 [30]	*Country* UK *Study period* May 2009-Dec 2010 *Study design* Surveillance/evaluation/audit	DBS testing introduced to Scotland as part of the Hepatitis C Action Plan for Scotland	Individuals (mainly PWID) across Scotland who were tested by DBS	1322	*Positivity (%)* 55% 36% (active infection)	*Quality score* NA Study population not clearly described	4.6% of the positive-testing population is non-PWID. It is not clear from the study methods if they are other drug users or why they were tested by DBS. The rest of the article insinuates that the DBS testing programme was focused on PWID, but this is not actually stated.

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
STI clinics							
HBV							
Richens, 2010 [31]	*Country* UK *Study period* June 2005 - July 2006 *Study design* RCT	A two-centre parallel three-arm randomised controlled open trial named The Computer Assisted Sexual Health Interviewing (CASHI) study. Patients were randomly assigned to be interviewed in one of three ways: 1. Computer-assisted self-interview (CASI) 2. Computer-assisted personal interview (CAPI), patient and clinician viewing the screen together, using the same interview as in CASI, but with data input by the clinician. 3. Pen and paper interview (PAPI) with a clinician, following the normal clinic practice of completing a proforma with the patient (usual care arm).	Patients over the age of 16 years with a new clinical episode (suggesting STI) attending two large London sexual health clinics, the Mortimer Market Centre and the Courtyard Clinic.	2480 assessed to be eligible (total) 2318 participated (total) 801 allocated; 795 analysed (CASI) 763 allocated; 744 analysed (CAPI) 787 allocated; 779 analysed (PAPI)	*Uptake (%)* 24.2% (CAPI) 16.9% (CASI) 16.3% (PAPI) *Patients indicators* Computer-assisted interviewing appeared to encourage the disclosure of sexual risk-taking.	*Quality score* acceptable No major comments	- Not all participants received the intervention that they were randomly allocated to. - Many different formats for electronic interviews are possible, such as the wording of questions and whether respondents are given freedom to skip questions, which are likely to affect response rates. - Clinicians seeing patients recruited into the CASI and CAPI arms of the study were required to conduct consultations in a way that was new and different (and in the case of CAPI, rather unpopular). If conducted in an environment where these new approaches were more familiar and established, it is likely that this might have produced different results.
HCV							
Parisi, 2014 [4]	*Country* Italy *Study period* Jan 2011 - Apr 2014 *Study design* Surveillance/evaluation/audit	A Prevention Program called EASY test project, using two new oral tests to diagnose the HCV and HIV infection.	People aged >18 years, unaware of their HCV serological status and able to complete the questionnaire in Italian or English who attended two points-of-care and one HIV-STDs public prevention outpatient clinic (FreeDay Easy) of the Infectious Diseases Department of San Raffaele Scientific Institute in Milan and extended to six general practitioner surgeries.	29,600 (total) 14000 (2011) 10000 (2012) 5000 (2013) 600 (2014)	*Uptake (%)* 15.2% (total) 9.1% (2011) 14% (2012) 16.9% (2013) 22% (2014) *Positivity (%)* 0.6% (total) 0.5% (2011) 0.5% (2011) 0.4% (2013) 4.5% (2014) Newly diagnosed (%)	*Quality score* NA No major comments	No comments
McLeod, 2014 [6]	*Country* UK *Study period* Jan 1999 - Dec 2011 *Study design* Pre-post study	Surveillance study on HCV testing examining impact of the Hepatitis C Action Plan consisting of awareness-raising activities, for GPs and those at risk, and the introduction of DBS sampling in community drug services to overcome barriers to testing.	Data on anti-HCV tests provided by the West of Scotland Specialist Virology Centre; East of Scotland Specialist Virology Centre; Department of Medical Microbiology at Aberdeen Royal Infirmary and Ninewells Hospital & Medical School. Positive results were laboratory confirmed.	33,677 (total) 1,699 (pre-Action Plan) 4,018 (Action Plan)	*Positivity (%)* 15.5% (total) 19.6% (pre-Action Plan) 10.1% (Action Plan)	*Quality score* NA No major comments	RR also reported for initial trend, level change in number tested and change in trend over each setting
Murira, 2016 [32]	*Country* UK *Study period* Oct 2013 - Oct 2014 *Study design* Pre-post study	Introduction of a clinic specific guideline in April 2014 for Hep C screening.	All genitourinary medicine (GUM) clinic attendees who were born in a country of Hep C prevalence of >2%. All HIV positive individuals were excluded.	2,664 (total) 1,299 (6 mo pre guideline) 1,354 (6 mo post guideline)	*Uptake (%)* 4.7% (6 mo pre guideline) 13.6% (6 mo post guideline) 2.88 times increase	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Scott, 2010 [33]	*Country* UK *Study period* 1 Jan 2007 - 31 June 2007 *Study design* Surveillance/evaluation/audit	Unselected anti-HCV screening for MSM attending sexual health screens introduced in clinics	All MSM unaware of their HCV status attending three sexual health clinics at the Chelsea and Westminster hospital. MSM who reported previous HCV infection were excluded from screening.	3365 attending STI screens 325 HIV positive	*Uptake (%)* 69% *Positivity (%)* 0.65% (95% CI 0.36%-1.1%) 0.88% HIV positive group (95% CI 0.18%-2.6%)	*Quality score* NA Method section is limited	No comments
Richens, 2010 [31]	*Country* UK *Study period* June 2005 - July 2006 *Study design* RCT	A two-centre parallel three-arm randomised controlled open trial named The Computer Assisted Sexual Health Interviewing (CASHI) study. Patients were randomly assigned to be interviewed in one of three ways: 1. Computer-assisted self-interview (CASI) 2. Computer-assisted personal interview (CAPI), patient and clinician viewing the screen together, using the same interview as in CASI, but with data input by the clinician. 3. Pen and paper interview (PAPI) with a clinician following the normal clinic practice of completing a proforma with the patient (usual care arm).	Patients over the age of 16 years with a new clinical episode (suggesting STI) attending two large London sexual health clinics, the Mortimer Market Centre and the Courtyard Clinic.	2480 assessed to be eligible (total) 2318 participated (total) 801 allocated; 795 analysed (CASI) 763 allocated; 744 analysed (CAPI) 787 allocated; 779 analysed (PAPI)	*Uptake (%)* 8.9% (CAPI) 3.3% (CASI) 2.8% (PAPI)	*Quality score* acceptable No major comments	- Not all participants received the intervention that they were randomly allocated to. - Many different formats for electronic interviews are possible, such as the wording of questions and whether respondents are given freedom to skip questions, which are likely to affect response rates. - Clinicians seeing patients recruited into the CASI and CAPI arms of the study were required to conduct consultations in a way that was new and different (and in the case of CAPI, rather unpopular). If conducted in an environment where these new approaches were more familiar and established, it is likely that this might have produced different results.
Mixed settings (not stratified)							
HCV							
Bishton, 2014 [34]	*Country* UK *Study period* 18 months *Study design* Surveillance/evaluation/audit	DBS testing offered for HCV, HBV and HIV, and vaccination offered for HBV	All who considered themselves at risk and current tier 3 drug treatment clients (including alcohol clients with a previous history of drug use), clients at the tier 2 drug treatment needle exchange, at the needle exchange at the local homeless clinic and at the two pharmacy needle-exchange sites with the highest current usage located in North East Essex.	NR	*Uptake (%)* 266 tested *Positivity (%)* 35% 53% (of % positive had active infection)	*Quality score* NA Method section is limited and no structure in the article	Short communication article
Defossez, 2008 [35]	*Country* France *Study period* 1 Nov 1997 - 31 Dec 1997 1 Feb 2000 - 31 March 2000 1 Feb 2003 - 31 May 2003 *Study design* Cross-sectional	Repeated comparative cross-sectional survey of HCV testing at three different time points to document trends in screening practises since implementation of a national plan to promote screening, including campaigns and screening guideline and set up of a network	Population living in the Poitou-Charentes region of southwest France who had their data tested or collected at private and public medical laboratories and prescribing physicians.	Unclear (1640453 1997 census data) (1649804 2000 census data) (1677855 2003 census data)	*Uptake (%)* 2.3% 1997 2.6% 2000 3.7% 2003 *Newly diagnosed (%)* 53% (69/130) 1997 55% (58/106) 2000 44% (96/216) 2003	*Quality score* NA Denominator was not clear	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Hickman, 2008 [36]	*Country* UK *Study period* Intervention start date: June - Dec 2004 (duration 6 mo) *Study design* RCT	A cluster randomized controlled trial. Sites were matched into pairs, with one site in each pair randomly allocated. Intervention sites: offered dried blood spot for diagnostic HCV antibody testing. Control sites continued with their current HCV testing practice: either testing patients on request or at selected times each week when specialist staff were available or referring patients elsewhere.	28 (14 pairs) specialist drug clinics and six (three pairs) prisons throughout England and Wales	6,550 (intervention) 5,800 (control)	*Uptake (%)* Intervention 8.4% (6 mo before intervention) 20.6% (during intervention) Control 7.7% (6 mo before intervention) 5.4% (during intervention) % difference intervention vs control: 14.5% (95% CI 1.3–28%, paired t-test, P = 0.033) *Positivity (%)* Overall from both intervention and control sites HCV positive antibodies were detected in 320 of the 1034 (32%) of the patients during the trial. During the same period in 11 of the laboratories, there were a total of 2700 of 51 000 (5%) specimens that tested HCV positive.	*Quality score* low No major comments	No baseline characteristics table and therefore don't know if groups are comparable

Table A-10. Evidence base for the effectiveness of testing initiatives in community settings

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Tafuri, 2010 [37]	*Country* Italy *Study period* May 2008 - July 2008 *Study design* Surveillance/evaluation/audit	Voluntary screening offered for HBV, HCV, HIV and syphilis.	A population of refugees of various nationalities who were in apparent good health and did not report signs or symptoms in the recent or remote past, living in the Asylum Seeker Centre in Bari Palese in Puglia, Southern Italy.	744	*Uptake (%)* 71.1% (529/744) *Positivity (%)* 8.3% 45.6% (anti-HBc)	*Quality score* NA No major comments	No comments
Okpo, 2015 [38]	*Country* UK *Study period* Freshers' week in autumn 2013 and spring 2014 *Study design* Surveillance/evaluation/audit	DBS testing offered for BBV. Information packs and leaflets were provided to the students before testing.	New students registering at two universities in Aberdeen	512	*Uptake (%)* 37% *Positivity (%)* 9.4% 3.1% (current infection) *Acceptance rate (%)* 37% *Patient indicators* No reports by students that the offer or testing process was stigmatising or undesirable *Provider indicators* No reports by staff that the offer or testing process was stigmatising or undesirable	*Quality score* NA Limited method section	No comments
Selvapatt, 2015 [39]	*Country* UK *Study period* 8 July 2014 - 22 Jan 2015 *Study design* Surveillance/evaluation/audit	Outreach screening using oral swab testing followed by direct linkage into local hepatology clinic without need for a GP referral	Homeless visiting the St Mungo's Centre for the Homeless, London	32 completed questionnaire	*Uptake (%)* 95 were tested *Positivity (%)* 63% 1% HIV co-infected 0% HBV co-infected *Patient indicators* Would agree to screening: 91% Thought oral swab test was acceptable form of testing: 91%	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Tafuri, 2010 [37]	*Country* Italy *Study period* May 2008 - July 2008 *Study design* Surveillance/evaluation/audit	Voluntary screening offered for HBV, HCV, HIV and syphilis.	A population of refugees of various nationalities who were in apparent good health and did not report signs or symptoms in the recent or remote past, living in the Asylum Seeker Centre in Bari Palese in Puglia, Southern Italy.	744	*Uptake (%)* 71.1% (529/744) *Positivity (%)* 4.7%	*Quality score* NA No major comments	No comments
Okpo, 2015 [38]	*Country* UK *Study period* Freshers' week in autumn 2013 and spring 2014 *Study design* Surveillance/evaluation/audit	DBS testing offered for BBV. Information packs and leaflets were provided to the students before testing.	New students registering at two universities in Aberdeen	512	Uptake (%) 37% Positivity (%) 0% *Acceptance rate (%)* 37% *Patient indicators* No reports by students that the offer or testing process was stigmatising or undesirable *Provider indicators* No reports by staff that the offer or testing process was stigmatising or undesirable	Quality score NA Limited method section	No comments
O'Sullivan, 2016 [40]	*Country* UK *Study period* Dec 2013 - Nov 2017 *Study design* Surveillance/evaluation/audit	Offer of dry blood spot testing (DBST), mobile transient elastography (TE), HCV treatment .	Drug users attending a large substance misuse service in South East England	391	Uptake (%) 49% (190/391) (DBST) Positivity (%) 20% HBcAb+	*Quality score* NA No major comments	Denominators not clear for HBV testing
Apoola, 2011 [41]	*Country* UK *Study period* Feb 2007 - Dec 2008 *Study design* RCT	The intervention (oral swab test) group had a pre-test discussion for HIV followed by an oral swab test for HIV, HBV and HCV. Results were available in two days. The control (blood test) group had a pre-test discussion for HIV followed by a referral to the same day HIV testing service carried out at the STI clinic. Here they were offered blood tests for HIV, HBV and HCV on the same day.	All young people (under 20 years, male and female) engaged with the young person's substance misuse service deemed competent to provide informed consent	27 (intervention) 28 (control)	*Uptake (%)* 92.6% (intervention) 7.4% (control)	*Quality score* acceptable No major comments	Randomization and blinding could be better; a simple randomisation procedure with opaque envelopes was used
Selvapatt, 2017 [42]	*Country* UK *Study period* 1 Apr 2012 - 1 Nov 2014 *Study design* Surveillance/evaluation/audit	A HCV screening and treatment outreach programme offering BBV screening using dry blood spot (DBS) testing, implemented within a DTU.	All persons attending the North Westminster Drug and Alcohol Service (NWDAS), a Central London Drug Treatment Unit (DTU).	321	*Uptake (%)* 67.3% (216/321) *Positivity (%)* 41% 31% (viraemic)	*Quality score* NA Data collection methods were not clear.	Data on costs/cost-effectiveness available
O'Sullivan, 2016 [40]	*Country* UK *Study period* Dec 2013 - Nov 2017 *Study design* Surveillance/evaluation/audit	Offer of dry blood spot testing (DBST), mobile transient elastography (TE), HCV treatment .	Drug users attending a large substance misuse service in South East England	391	*Uptake (%)* 49% (190/391) (DBST) *Positivity (%)* 0,53%	*Quality score* NA No major comments	Denominators not clear for HCV testing

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Tait, 2013 [21]	*Country* UK *Study period* 2009-2011 *Study design* Surveillance/evaluation/audit	DBS testing offered to all individuals who accessed needle exchange (NEXC) or drug treatment services (DTS)	Drug users living in Tayside who accessed needle exchange (NEXC) or drug treatment services (DTS)	Tested: 1123 total 631 NEXC 492 DTC	*Uptake (%)* 84.2% 18.7% (follow-up test within 1 y after the first) *Positivity (%)* 31.2% total 27.5% NEXC 35.3% DTC *Newly diagnosed (%)* 22.6% total 22.4% NEXC 22.8% DTC	*Quality score* NA No major comments	No comments
Apoola, 2011 [41]	*Country* UK *Study period* Feb 2007 - Dec 2008 *Study design* RCT	The intervention (oral swab test) group had a pre-test discussion for HIV followed by an oral swab test for HIV, HBV and HCV in the community setting. Results were available in two days. The control (blood test) group had a pre-test discussion for HIV followed by a referral to the same day HIV testing service carried out at the STI clinic. Here they were offered blood tests for HIV, HBV and HCV on the same day.	All young people (under 20 years, male and female) engaged with the young person's substance misuse service deemed competent to provide informed consent	27 (intervention) 27 (control)	*Uptake (%)* 100% (intervention) 7.4% (control)	*Quality score* acceptable No major comments	Randomisation and blinding could be better; a simple randomisation procedure with opaque envelopes was used
McLeod, 2014 [6]	*Country* UK *Study period* Jan 1999 - Dec 2011 *Study design* Pre-post study	Surveillance study on HCV testing examining impact of the Hepatitis C Action Plan consisting of awareness-raising activities, for GPs and those at risk, and the introduction of DBS sampling in community drug services to overcome barriers to testing.	Data on anti-HCV tests provided by the West of Scotland Specialist Virology Centre; East of Scotland Specialist Virology Centre; Department of Medical Microbiology at Aberdeen Royal Infirmary and Ninewells Hospital & Medical School. Positive results were laboratory confirmed.	5,399 (total) 67 (pre-Action Plan) 973 (Action Plan)	*Positivity (%)* 9% (total) 10.5% (pre-Action Plan) 8.3% (Action Plan)	*Quality score* NA No major comments	RR also reported for initial trend, level change in number tested and change in trend over each setting
Roux, 2016 [43]	*Country* France *Study period* 2011 - 2013 *Study design* Non-randomised trial	A national, clustered, multi-site intervention study ANRS-AERLI, providing community-based educational training and education about injection, organized as a series of participant-centred face-to-face educational sessions at harm-reduction centres **(intervention),** compared with centres with no educational sessions (**control).** All participants were interviewed on three occasions: enrolment, 6 and 12 months.	PWID who spontaneously asked for help or information related to injection and who could be reached by phones attending 17 low-threshold drug user harm reduction (HR) centres in France (8 intervention 9 control)	Baseline 88 (intervention) 114 (control) 12 mo 27 (intervention) 54 (control)	*Uptake (%)* Intervention (baseline; 12 mo) 44%; 85% testing during previous 6 mo Control group (baseline; 12 mo) 51%; 78% testing during previous 6 mo *Positivity (%)* Self-reported HCV seropositivity 15% (intervention) 14% (control) Newly diagnosed (%)	*Quality score* acceptable No major comments	Participants received a monetary incentive for each telephone interview

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Hope, 2012 [44]	*Country* UK *Study period* 2000 - 2008 *Study design* Surveillance/evaluation/audit	Annual voluntary unlinked-anonymous survey examining the impact of the HCV Action Plan, launched in 2004; a national framework of activities to improve prevention, diagnosis and treatment of HCV. The survey consisted of a HCV test in oral fluid and measured self-reports of uptake of voluntary confidential testing (VCT) for HCV.	Recent initiates to injecting drug use (i.e. had first injected in the preceding 3 years) who participated in the survey, attending 60 drug agencies (both statutory and non-statutory providers of advice, harm reduction, or treatment services) throughout England.	3,463 participants of the survey between 2000-2008	*Uptake (%)* 42% (reported having ever had a VCT for HCV) *Positivity (%)* 18%	*Quality score* NA No major comments	Self-reported uptake
Craine, 2009 [45]	*Country* UK *Study period* 1 May 2007 - 30 Apr 2008 (DBS testing) 1 May 2006 - 30 Apr 2007 (BBV testing) *Study design* Pre-post study	A clinical audit of the uptake of DBS testing in a single SMS in the first year of its introduction as a standard diagnostic testing option compared with BBV testing of SMS clients by venepuncture in the previous year.	All clients of the substance misuse service (SMS) national healthcare clinic with a history of injecting drug use		35 tested by venepuncture (2006-2007) 24 tested by venepuncture (2007-2008) 202 tested by DBS (2007-2008)	*Quality score* NA No major comments	No comments
Williams, 2017 [46]	*Country* UK *Study period* Sep 2015 – Mar 2016 *Study design* Surveillance/evaluation/audit	Pilot home-sampling service, accessible via an online service, allowing access to screening for sexually transmitted infections (STIs). Overall acceptability was assessed via online feedback survey and in-depth interviews with service users.			*Uptake (%)* 4305 kits requested 48% of the test returned (15% providing insufficient blood samples) *Positivity rate (%)* 0.2% *Patient indicators* 39% reported difficulties taking blood samples. 95% said they would use the online service again and 93% would recommend it to family and friends. There was no significant reduction in asymptomatic attendances to STI clinics since introduction of the online service.	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
van der Veen, 2014 [47]	*Country* Netherlands *Study period* September 2010 *Study design* RCT	A clustered randomized three-group pre and post-test design with three online interventions designed to promote HBV screening in first generation Turkish migrants. One intervention offered behavioural tailoring (BT), and the other intervention offered behavioural tailoring plus cultural tailoring (BCT). Both interventions were based on computer tailoring (a strategy that targets a specific person based on characteristics that are unique to that person). The last intervention group received generic information (GI) about HBV, HBV prevention and HBV treatment (this information was the same as that offered in the knowledge modules in the BT and BCT interventions). Subsequently, free HBV screening was offered	Rotterdam-registered people who were born in Turkey and who were 16–40 years old on 1 September 2010. Migrants who had been tested (and were sure that they were an HBV carrier or were immune to HBV) or if they had been vaccinated and had a sufficient vaccine response were excluded.	10069 invited 1512 logged in via website 1400 eligible for screening 496 (GI) 432 (BT) 472 (BCT)	*Uptake (%)* 44.5 (overall) 43.9% BCT (OR 0.94 95% CI 0.69-1.26) 43.5% BT (OR 0.88 95% CI 0.65-1.19) 46.0% GI	*Quality score* acceptable No major comments	- the low response rate (15%) may have caused selection bias, as participants were likely more motivated regarding HBV testing than nonparticipants, and this may have influenced their response to the randomized interventions. - Due to unanticipated political sensitivity regarding culturally specific health promotion activities in the target population, the programme organization was severely limited in seeking public attention for this programme.
Ruutel, 2015 [48]	*Country* Estonia *Study period* Apr 2013 - Sept 2013 *Study design* Surveillance/evaluation/audit	An Internet-based recruitment system for HIV and STI screening using a questionnaire. All the participants were offered voluntary, anonymous and free-of-charge HIV and STI testing using a special web-based testing service called Testikodus ('Test at Home' in English).	Participants were self-identifying as male; living in Estonia; age of 18 years or older; and being sexually attracted to men and/or having ever had sex with a man. Testing took place at the QM laboratory in six sites in larger cities across Estonia.	265	*Uptake (%)* 16.2% (43/265) *Positivity (%)* 0%	*Quality score* NA No major comments	No comments
Ruutel, 2015 [48]	*Country* Estonia *Study period* Apr 2013 - Sept 2013 *Study design* Surveillance/evaluation/audit	An Internet-based recruitment system for HIV and STI screening using a questionnaire. All the participants were offered voluntary, anonymous and free-of-charge HIV and STI testing using a special web-based testing service called Testikodus ('Test at Home' in English).	Participants were self-identifying as male; living in Estonia; age of 18 years or older; and being sexually attracted to men and/or having ever had sex with a man. Testing took place at the QM laboratory in six sites in larger cities across Estonia.	265	*Uptake (%)* 16.2% (43/265) *Positivity (%)* 4.6%	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Zuure, 2011 [49]	*Country* Netherlands *Study period* April 2007 - Dec 2008 *Study design* Surveillance/evaluation/audit	A pilot project combining a mass media information campaign on HCV in the general population with an online risk-assessment tool and free blood-testing procedure for HCV. Individuals who reported at least one risk factor for HCV were advised to have a blood test.	Inhabitants of Amsterdam and South Limburg in the Netherlands, who were at risk for HCV. Individuals already diagnosed with HCV infection were excluded.	9653 eligible website visitors who completed questionnaire	*Offered (%)* 15.3% *Uptake (%)* 4.4% *Positivity (%)* 4.5% 2.8% chronic infection *Acceptance rate (%)* 28.4%	*Quality score* NA No major comments	The reach of the media campaign was not measured. It is unknown whether participants at risk who were not tested through the project decided to be tested elsewhere.
Foucher, 2009 [50]	*Country* France *Study period* Jan 2006 - Jan 2007 *Study design* Surveillance/evaluation/audit	Street-based outreach offering non-invasive FibroScan, counselling and testing for HCV and HBV.	All consecutive drug users (>18 years) in two street-based outreaches	298	*Offered (%)* 100% *Uptake (%)* 76.2% *Positivity (%)* 0% *Acceptance rate (%)* 97.3% (agreed to the principle)	*Quality score* NA No major comments	No comments
Story, 2016 [51]	*Country* UK *Study period* March 2011-June 2013 *Study design* Surveillance/evaluation/audit	NHS mobile screening service	Homeless attending an NHS mobile screening service		*Uptake (%)* 491 tested *Positivity (%)* 12.4% past or current infection	*Quality score* NA No major comments	No comments
Coenen, 2016 [52]	*Country* Netherlands *Study period* 2009 - 2013 *Study design* Surveillance/evaluation/audit	Five large-scale Dutch independent outreach screening programmes that offered targeted HBV screening to first-generation Chinese migrants aiming at secondary prevention. The campaigns combined disease awareness activities with free HBV testing. Key Chinese organisations and figures were engaged in the campaign. The campaign started on Chinese new year, and information was printed in Chinese newspapers, folders and a special website. In Utrecht, Arnhem and Eindhoven, registered Chinese were contacted by letter	First-generation Chinese migrants from Rotterdam (2009), The Hague (2010), Utrecht (2011), Arnhem/Nijmegen region (2013) and Eindhoven (2013). In the screening phase participants were offered free HBV testing at community outreach locations (e.g. Chinese schools and churches).	29000	*Uptake (%)* ≈ 15.3%: 4423 of approximately 29,000 (the Chinese population living in Rotterdam, the Hague, Utrecht, Arnhem/Nijmegen and Eindhoven) *Positivity (%)* 6.0% *Newly diagnosed (%)* 2.9%	*Quality score* NA Data collection methods were not clear.	The actual population might be higher because a large number of Chinese migrants are not officially registered.
Zuure, 2013 [53]	*Country* Netherlands *Study period* 2009-2010 *Study design* Surveillance/evaluation/audit	Community-based HBV/HCV free-of-cost screening programme; combining education and screening sessions, promoted by key community figures with flyers	Egyptian first generation migrants (18 years and older) recruited/tested at a Coptic church, two mosques, an Egyptian women's empowerment organisation, an Egyptian trade organisation, a weekend school for Islamic Egyptians and an Egyptian supermarket	1500 flyers sent to community organisations for distribution	*Uptake (%)* 31% (465/1500) *Positivity (%)* 1.1% 16.8 % Anti-HBc+ *Newly diagnosed (%)* 0.6%	*Quality score* NA Denominator is not appropriate	Denominator is the approximate number of flyers sent for distribution, it is not known how many individuals received flyers, so uptake may be underestimated

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Richter, 2012 [54]	*Country* Netherlands *Study period* NR *Study design* Surveillance/evaluation/audit	Culturally-targeted screening project involving campaigns with posters, brochures, newspaper and radio segments, a documentary video and website. Educational meetings concerning hepatitis were organized, with all participants being offered a blood screening test by a mobile laboratory team.	Turkish migrants living in the Turkish community of Arnhem, the Netherlands and attending community centres, mosques and/or the GP	6337 total Turkish population of Arnhem	*Uptake (%)* 11.2% 10.2% tested with complete data set *Positivity (%)* 2.78% (HBsAg) 3.87% (anti-HBc) 0% (HBeAg) *Patient indicators* Considered educational meeting good and understandable: 97% Willing to pass on the new knowledge to family members and friends:48% Willing to distribute brochures: 14% Orally, they reported back that they were very satisfied regarding the information, the organization of the project, and that they felt they were taken seriously	*Quality score* NA Denominator not clear	- Results unclearly written, denominator in each case was not clear. - Positivity rate was higher than that reported from Arnhem hospital records - The testing offer was taken up by around 10% of the population, but it is not reported how many were aware of the testing offer and what the uptake was among these.
Veldhuijzen, 2012 [55]	*Country* Netherlands *Study period* 2009 *Study design* Surveillance/evaluation/audit	A campaign combining disease awareness activities with free testing at outreach locations	Chinese migrants (first and second generation) living in Rotterdam		*Uptake (%)* 1090 screened *Positivity (%)* 8.5% Chronic HBV (anti-HBc+/HBsAg+) 41% Previous HBV (anti-HBc+/ HBsAg-)	*Quality score* NA Sample may not be representative of study population	- Women and older people were overrepresented among the respondents. People who know they are chronically infected may not take part in screening, however, people with infected family members may be more likely to take part
McPherson, 2013 [56]	*Country* UK *Study period* NR *Study design* Surveillance/evaluation/audit	Targeted case finding: Subjects invited to HBV education and screening sessions held in community centres. HBsAg and HBcAb were tested with dry blood spot tests (DBST).	A 'high' prevalence community of North East (NE) England – British–Chinese, as well as an 'intermediate' community – the British–South Asian community (Pakistan, India, Bangladesh or Sri Lanka) attending 4 sites in the NE of England (the NCHLC; the True Jesus Church, Shieldfield, Newcastle; the True Jesus Church, Sunderland and The Tees Valley Chinese Community Centre, Middlesbrough) and 5 Mosques in Newcastle and Middlesbrough and the Sunderland Bangladeshi community centre, respectively.	86,000 (total) 21,000 (British-Chinese) 65,000 (British-South Asians)	*Uptake (%)* 606 tested (British-Chinese) 520 tested (British-South Asians) *Positivity (%)* 5.5% (of which 16.1% had previous infection) 8% (anti-HBc) 8.7% (British-Chinese) 1.7% (British-South Asians) 13% (anti-HBc British-Chinese) 1.7% (anti-HBc British-South Asians) *Newly diagnosed (%)* 4.6% cHBV (excluding with known cHBV) 7.2% (British-Chinese) 1.7% (British-South Asians)	*Quality score* NA Data collection methods were not clear.	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Vedio, 2013 [57]	*Country* UK *Study period* Sept 2009-June 2012 *Study design* Surveillance/evaluation/audit	Pilot project of DBS testing in outreach settings frequented by the Chinese community. Testing was advertised in Chinese language newspapers , papers and bulletins and through GPs	Chinese migrants offered DBS testing at the Kinhon Chinese centre, a Chinese church, a Saturday Chinese school and a Chinese wholesaler in Sheffield		*Uptake* 299 tested *Positivity (%)* 8.7% 12.2% past infection (HBsAg−/HBcAb+) *Patient indicators* Information session was useful: 100% Able to ask all the questions: 93.7% Explanations were clear: 96.5% The test caused any discomfort: 5%	*Quality score* NA Sample may not be representative of study population	- 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.
Jafferbhoy, 2012 [58]	*Country* UK *Study period* July 2009 *Study design* Surveillance/evaluation/audit	An outreach testing intervention consisting of a series of HCV awareness meetings. Thereafter short-term outreach HCV testing clinics were set up in the same venues. Venous blood samples were obtained and tested for HCV IgG and HbsAg. A short questionnaire was also completed.	Immigrant Pakistani population visiting the three mosques and Pakistani Women's centre in the city of Dundee, Scotland	1,723 Pakistani individuals registered in Dundee	*Uptake (%)* 9,8% (170/1723) *Positivity (%)* 0.6%	Quality score NA No major comments	- The testing offer was taken up by almost 10% of the population, but it is not reported how many were aware of the testing offer and what the uptake was among these. - Testing was offered at mosques, which excludes individuals who do not attend and some women who may pray at home.
Sahajian, 2011 [59]	*Country* France *Study period* 22 Oct 2007 - 22 Apr 2009 *Study design* RCT	Two screening strategies (S1 and S2) and non-intervention strategy (S0) completed by a mobile team. The intervention shelters involved group information sessions followed by an individual consultation (IC) during which subjects were offered systematic taking of blood (for biological blood examinations and screening serology) associated with a medical check-up. S1 shelters referred participants for testing at a health centre and S2 shelters performed on-site testing.	Underprivileged people aged over 18 years old living in 18 shelters in the Lyon area (6 shelters per intervention group). Taking of blood and check-up were either conducted at the Welfare and Health Examination Centres (WHECs) (S1) or at the Lyon area shelters (S2).	Total population: 811 (S0) 1041 (S1) 784 (S2) Included population (for S1 and S2 these are participants attending group information sessions and accepting taking of blood): 811 (S0) 222 (S1) 243 (S2)	*Uptake (%)* Uptake in total pop: 1.5% (S0) 9.1% (S1) 18.6% (S2) p<10-6 Uptake in included pop: 1.5% (12/811)(S0) 42.8% (95/222)(S1) 59.7% (145/243)(S2) p <10-6 *Positivity (%)* HBsAg; anti-HBc 0%; 0% (S0) 2.1%; 67.4% (S1) 4.8%; 70.3%(S2)	*Quality score* acceptable No major comments	Randomization method and concealment were not described.
Foucher, 2009 [50]	*Country* France *Study period* Jan 2006 - Jan 2007 *Study design* Surveillance/evaluation/audit	Street-based outreach offering non-invasive FibroScan, counselling and testing for HCV and HBV.	All consecutive drug users (>18 years) in two street-based outreaches	298	*Offered (%)* 100% *Uptake (%)* 76.2% *Positivity (%)* 37.6% *Newly diagnosed (%)* 11% *Acceptance rate (%)* 97.3% (agreed to the principle)	*Quality score* NA No major comments	No comments
Story, 2016 [51]	*Country* UK *Study period* March 2011-June 2013 *Study design* Surveillance/evaluation/audit	NHS mobile screening service	Homeless people attending an NHS mobile screening service		*Uptake* 491 *Positivity rate (%)* 13.0% current infection	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Zuure, 2013 [53]	*Country* Netherlands *Study period* 2009-2010 *Study design* Surveillance/evaluation/audit	Community-based HBV/HCV free-of-cost screening programme; combining education and screening sessions, promoted by key community figures with flyers	Egyptian first generation migrants (18 years and older) recruited/tested at a Coptic church, two mosques, an Egyptian women's empowerment organisation, an Egyptian trade organisation, a weekend school for Islamic Egyptians and an Egyptian supermarket	1,500 flyers sent to community organisations for distribution	*Uptake (%)* 31% (465/1500) *Positivity (%)* 2.4% 2.2% HCV-RNA+ *Newly diagnosed (%)* 1.9%	*Quality score* NA Denominator is not appropriate	Denominator is the approximate number of flyers sent for distribution, it is not known how many individuals received flyers, so uptake may be underestimated
Richter, 2012 [54]	*Country* Netherlands *Study period* NR *Study design* Surveillance/evaluation/audit	Culturally-targeted screening project involving campaigns with posters, brochures, newspaper and radio segments, a documentary video and website. Educational meetings concerning hepatitis were organized, with all participants being offered a blood screening test by a mobile laboratory team.	Turkish migrants living in the Turkish community of Arnhem, the Netherlands and attending community centres, mosques and/or the GP	6,337 total Turkish population of Arnhem	*Uptake (%)* 11.2% 10.2% tested with complete data set *Positivity (%)* 0.3% 0.3% (HCV-RNA) *Patient indicators* Considered educational meeting good and understandable: 97% Willing to pass on the new knowledge to family members and friends:48% Willing to distribute brochures: 14% Orally, they reported back that they were very satisfied regarding the information, the organization of the project, and that they felt they were taken seriously	*Quality score* NA Denominator not clear	- Results unclearly written, denominator in each case was not clear. - Positivity rate was higher than that reported from Arnhem hospital records - The testing offer was taken up by around 10% of the population, but it is not reported how many were aware of the testing offer and what the uptake was among these.
Jafferbhoy, 2012 [58]	*Country* UK *Study period* July 2009 *Study design* Surveillance/evaluation/audit	An outreach testing intervention consisting of a series of HCV awareness meetings. Thereafter short-term outreach HCV testing clinics were set up in the same venues. Venous blood samples were obtained and tested for HCV IgG and HbsAg. A short questionnaire was also completed.	Immigrant Pakistani population visiting the three mosques and Pakistani Women's centre in the city of Dundee, Scotland	1,723 Pakistani individuals registered in Dundee	*Uptake (%)* 9,8% (170/1723) *Positivity (%)* 4.1% (95% CI 2%-8%) 2.9% (HCV-RNA)	Quality score NA No major comments	- The testing offer was taken up by almost 10% of the population, but it is not reported how many were aware of the testing offer and what the uptake was among these. - Testing was offered at mosques, which excludes individuals who do not attend and some women who may pray at home.

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
McPherson, 2013 [56]	*Country* UK *Study period* NR *Study design* Surveillance/evaluation/audit	Targeted case finding: Subjects invited to HBV education and screening sessions held in community centres. HBsAg and HBcAb were tested with dry blood spot tests (DBST).	A 'high' prevalence community of North East (NE) England – British–Chinese, as well as an 'intermediate' community – the British–South Asian community (Pakistan, India, Bangladesh or Sri Lanka) attending 4 sites in the NE of England (the NCHLC; the True Jesus Church, Shieldfield, Newcastle; the True Jesus Church, Sunderland and The Tees Valley Chinese Community Centre, Middlesbrough) and 5 Mosques in Newcastle and Middlesbrough and the Sunderland Bangladeshi community centre, respectively.	65,000 (British-South Asians)	*Uptake (%)* 520 tested (British-South Asians) *Positivity (%)* 0.8%	*Quality score* NA Data collection methods were not clear.	No comments
Sahajian, 2011 [59]	*Country* France *Study period* 22 Oct 2007 - 22 Apr 2009 *Study design* RCT	Two screening strategies (S1 and S2) and non-intervention strategy (S0) completed by a mobile team. The intervention shelters involved group information sessions followed by an individual consultation (IC) during which subjects were offered systematic taking of blood (for biological blood examinations and screening serology) associated with a medical check-up. S1 shelters referred participants for testing at a health centre and S2 shelters performed on-site testing.	Underprivileged people aged over 18 years old living in 18 shelters in the Lyon area (6 shelters per intervention group). Taking of blood and check-up were either conducted at the Welfare and Health Examination Centres (WHECs) (S1) or at the Lyon area shelters (S2).	Total population: 811 (S0) 1041 (S1) 784 (S2) Included population (for S1 and S2 these are participants attending group information sessions and accepting taking of blood): 811 (S0) 222 (S1) 243 (S2)	*Uptake (%)* Uptake in total pop: 1.5% (S0) 9.1% (S1) 18.6% (S2) p<10-6 Uptake in included pop: 1.5% (12/811)(S0) 42.8% (95/222)(S1) 59.7% (145/243)(S2) p <10-6 *Positivity (%)* 0% (S0) 3.2% (S1) 2.8% (S2)	*Quality score* acceptable No major comments	Randomization method and concealment were not described.
Wood, 2014 [60]	*Country* UK *Study period* Apr 2013 - Dec 2013 *Study design* Surveillance/evaluation/audit	A novel outreach STI screening service incorporating nurse-delivered screening at a monthly screening clinic held at the sauna, and self-sampled postal testing kits (DBS fingerprick testing). Health promotion workers were present at the venue three days a week. The service was compared to standard screening at a local sexual health clinic.	Asymptomatic men who have sex with men (MSM) visiting a local sauna in a predominantly rural area	First 30 users of each service: 30 (sauna nurse outreach) 30 (DIY postal kits) 30 (sexual health clinic)	*Uptake (%)* Ever tested for STI; accepted blood screening 53.3%; 83.3% (sauna nurse outreach) 60%; 53.3% (DIY postal kits) 93.3%; 100% (Sexual health clinic) *Positivity (%)* HBV or HCV active; cleared infection 0%; 4% (Sauna nurse outreach) 6.25%; 25% (DIY postal kits) 0%; 0% (Sexual health clinic) Newly diagnosed (%)	*Quality score* NA Result section is limited and data is not analysed in depth	Outcomes not specified for HBV or HCV

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
Bishton, 2014 [34]	*Country* UK *Study period* 18 months *Study design* Surveillance/evaluation/audit	DBS testing offered for HCV, HBV and HIV, and vaccination offered for HBV	All who considered themselves at risk and current tier 3 drug treatment clients (including alcohol clients with a previous history of drug use), clients at the tier 2 drug treatment needle exchange, at the needle exchange at the local homeless clinic and at the two pharmacy needle-exchange sites with the highest current usage located in North East Essex.	NR	*Uptake (%)* 266 tested *Positivity (%)* 35% 53% (of % positive had active infection)	*Quality score* NA Method section is limited and no structure in the article	Short communication article
Fernandez-Lopez, 2016 [61]	*Country* Spain *Study period* Apr 2011 - Dec 2011 *Study design* Surveillance/evaluation/audit	Oral fluid rapid test	PWID who never had a test, had been tested but not sure of the result or had a negative test in the previous 6 months, who visit 13 Harm Reduction Programmes (HRP) in Catalonia, Spain (Six HRP were classified as facility-based centres, five as mobile units or street outreach teams and two HRP were classified as mixed HRP)	240	*Offered (%)* 73% *Uptake (%)* 72% (172/240) *Positivity (%)* 20.3% (overall) 11.3% (13/115 facility-based centre) 44.8% (13/29 mobile unit) 32.1% (9/28 mixed) *Acceptance rate (%)* 98.2% *Provider indicators* Both oral swab testing and test interpretation were either easy or very easy: 100% . Expressing full confidence in the results: 60%; Partially confident of the test results: 40%	*Quality score* NA Data collection methods were not clear.	No comments

Table A-11. Evidence base for the effectiveness of testing initiatives in multiple settings

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
HCV							
Delarocque-Astagneau, 2010 [62]	*Country* France *Study period* Sero-prevalence surveys: 1994 and 2004 Rena-VHC and Hepatology reference centres surveillance networks: 2000-2006 *Study design* Pre-post study	Before-after study to look at impact of national HCV prevention programme (national institute for surveillance (Institut de Veille Sanitaire, InVS))	Individuals tested as part of a seroprevalence survey, eligible for a medical check-up in a social security medical centre (SSMC) in four regions of France (1994) and of five primary health insurance units linked to a SSMC (2004). In addition, all blood samples were tested for HCV in one of the 281 laboratories participating in the Rena-VHC surveillance network; newly referred HCV+ patients attended one of the 26 hepatology reference centres that are part of the hepatology reference centre surveillance network.		*Uptake (%)* Before: 301,998 tests After: 437,524 (2005) After: 394,882 (2006) *Positivity (%)* 4.3% (2000) 2.9% (2006) 1.3% (2000, confirmed positive) 0.6% (2006, confirmed positive)	*Quality score* NA No major comments	No comments

Reference	Study characteristics	Testing approach	Study population and setting	Sample N	Outcomes	Critical appraisal	General comments
McLeod, 2014 [6]	*Country* UK *Study period* Jan 1999 - Dec 2011 *Study design* Pre-post study	Surveillance study on HCV testing examining impact of the Hepatitis C Action Plan consisting of awareness-raising activities, for GPs and those at risk, and the introduction of DBS sampling in community drug services to overcome barriers to testing.	Data on anti-HCV tests provided by the West of Scotland Specialist Virology Centre; East of Scotland Specialist Virology Centre; Department of Medical Microbiology at Aberdeen Royal Infirmary and Ninewells Hospital & Medical School. Positive results were laboratory confirmed.	297,689 (total) 19,058 (pre-Action Plan) 29,045 (Action Plan)	*Positivity (%)* 8.1% (total) 9.6% (pre-Action Plan) 6.8% (Action Plan)	*Quality score* NA No major comments	RR also reported for initial trend, level change in number tested and change in trend over each setting
McLeod, 2014 [6]	*Country* UK *Study period* Jan 1999 - Dec 2011 *Study design* Pre-post study	Surveillance study on HCV testing examining impact of the Hepatitis C Action Plan consisting of awareness-raising activities, for GPs and those at risk, and the introduction of DBS sampling in community drug services to overcome barriers to testing.	Data on anti-HCV tests provided by the West of Scotland Specialist Virology Centre; East of Scotland Specialist Virology Centre; Department of Medical Microbiology at Aberdeen Royal Infirmary and Ninewells Hospital & Medical School. Positive results were laboratory confirmed.	15,319 (total) 1,079 (pre-Action Plan) 1,338 (Action Plan)	*Uptake (%)* 67 tested pre-action plan 973 tested during action plan *Positivity (%)* 36.3% (total) 19.4% (pre-Action Plan) 38.1% (Action Plan)	*Quality score* NA No major comments	RR also reported for initial trend, level change in number tested and change in trend over each setting

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