



Public Health
England

Lyme disease conference

Epidemiology of Lyme in England and Wales

Robert Smith, Public Health Wales

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Lyme disease in England and Wales

Dr Robert Smith

Health Protection Division

Public Health Wales

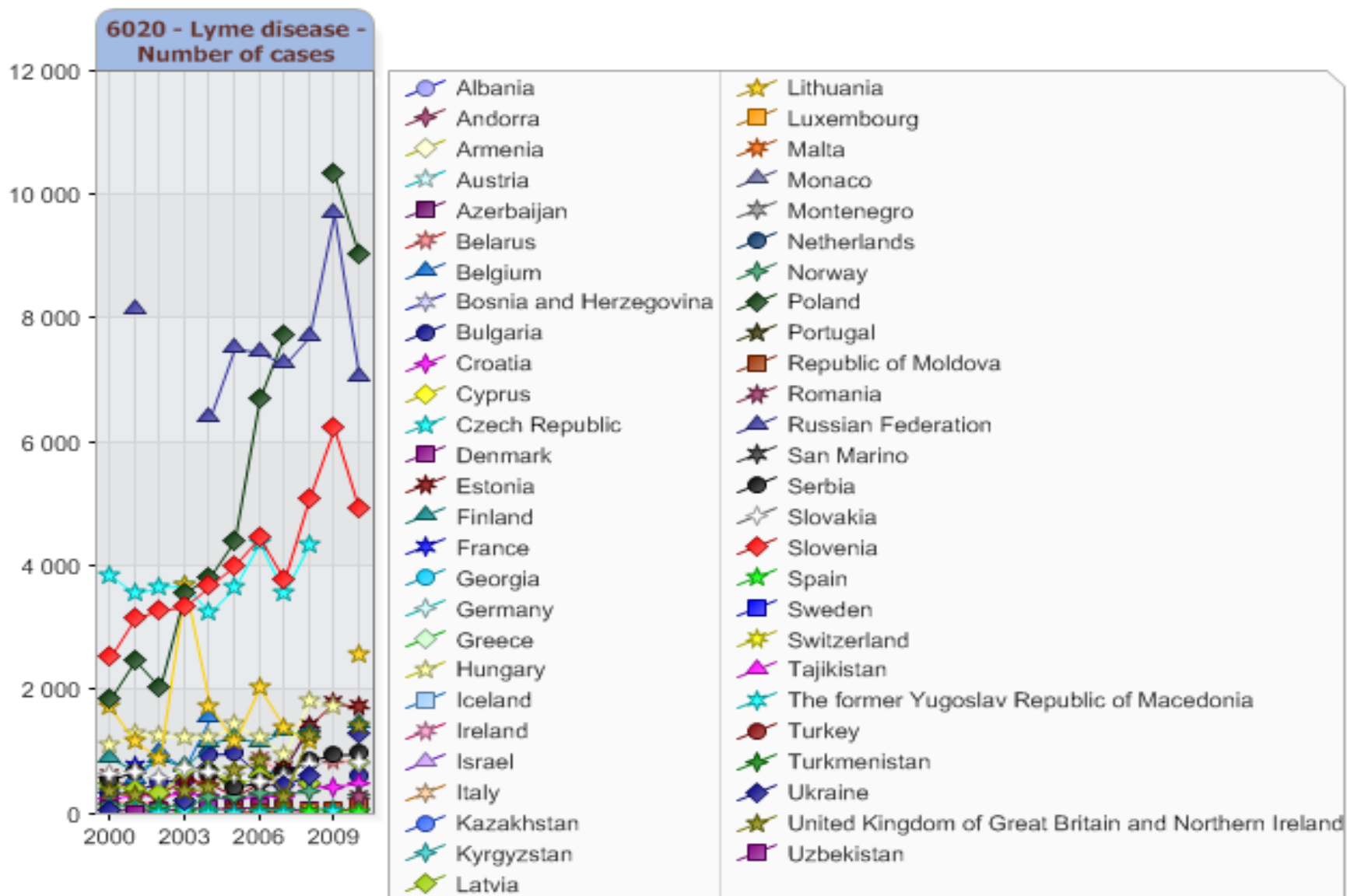
Lyme Surveillance

- Monitored thro' passive & enhanced surveillance since first reported in Sept 1986
- *Passive surveillance* : Since 2010 all NHS & private laboratories in E&W required to notify all laboratory diagnoses of LB to PHE; previously voluntary
- *Enhanced surveillance*: 1997 – 2003 questionnaires sent to clinicians; surveillance improved (85% return rate in yr 1)
- Single reference laboratory since 2000, previously HPA Southampton, now RIPL at PHE Porton

Lyme epidemiology

- 1,201 *serologically confirmed* cases in UK in 2011; 1,163 in 2012
- Between 2,000 and 3,000 cases overall / year
- 959 serologically confirmed cases in England and Wales, in 2011, including 90 neuroborreliosis (mainly facial palsies, Garin-Bujadoux-Bannwarth syndrome, radiculopathies)
- Upward trend overall in past few years; partly reporting bias (increased attention and recognition); partly genuine.
 - Increases in tick populations in some parts of UK: expanding deer range; several mild winters and damp summers, with increased tick survival.
 - Increased recreational activities in the great outdoors.
 - Increased numbers of “imported” cases; UK people going abroad (esp. to new European destinations) and migrants from highly-endemic countries
- Neuroborreliosis rates have stayed steady over past 5 years (*good sentinel for later stage infection*)

Lyme disease in Europe: 2001-2010



Source: WHO

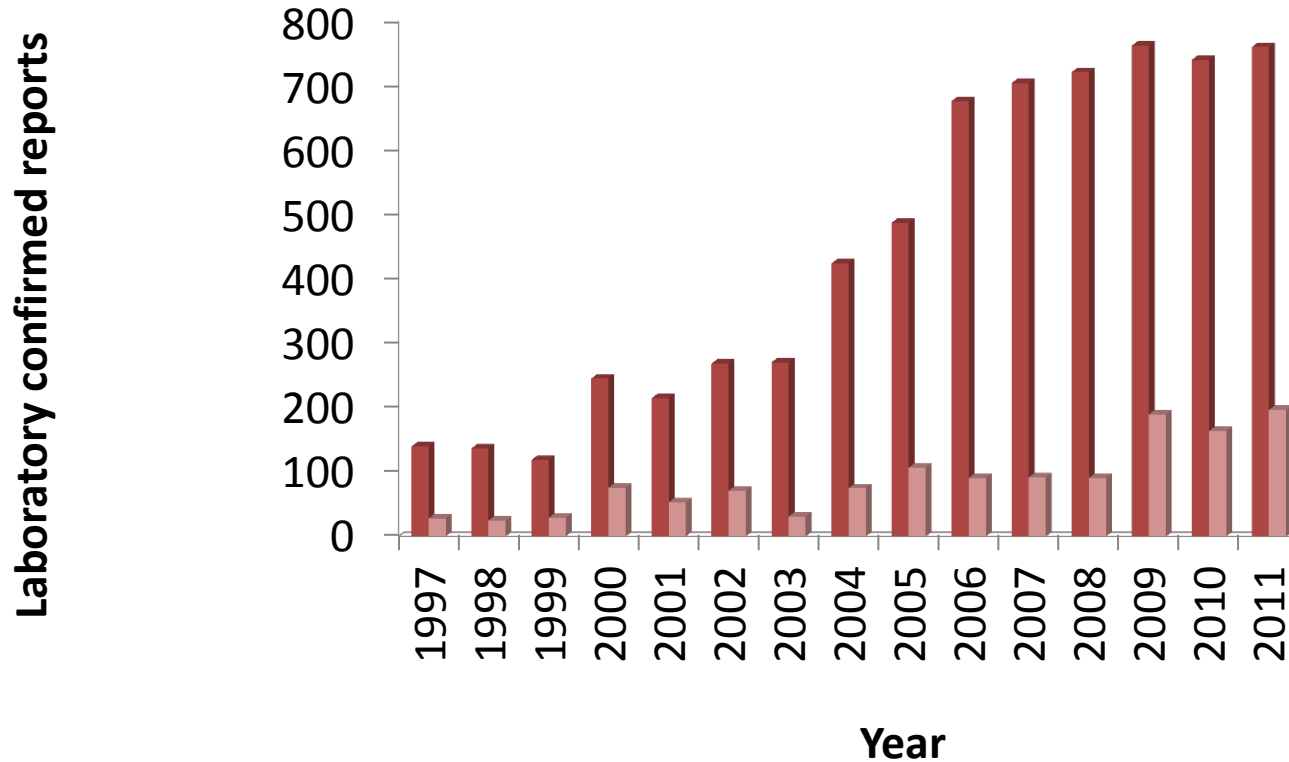
Lyme Borreliosis

- *B. burgdorferi* infection can be asymptomatic, cause minimal symptoms, or systemic disease mainly affecting nervous or musculoskeletal tissue
- European prospective studies have shown that about 90% of symptomatic infections manifest as ***erythema migrans***, a spreading rash from the site of a tick bite, appearing within about 3-30 days (average 5-15 days)
- May be accompanied by 'flu-like illness without significant respiratory symptoms; ***myalgias, arthralgias***
- The major complications involve the nervous system; usually present between about 6 weeks and 4 months of infection:
 - ***facial palsy, viral-like meningitis, radiculopathy (shingles-like pain without a shingles-type rash)***Other cranial nerve palsies, meningoencephalitis, uveitis are uncommon

Lyme disease – Late presentations

- **Late neuroborreliosis** (*encephalomyelitis, peripheral neuropathy*) are **rare** manifestations of **previously untreated** infection. Can give MS-like clinical presentation
- **Lyme arthritis** is a well-recognised complication of American-acquired LB; uncommon in European-acquired infection. Usually affects a large joint, particularly the knee (***swelling +++***, ***out of proportion to the pain***). Can have an autoimmune component in some patients, causing more prolonged arthritis requiring anti-inflammatory treatments in addition to antibiotics.
- **Acrodermatitis chronica atrophicans (ACA)** is an unusual late manifestation of active (previously untreated) infection affecting the skin. Usually caused by *B. afzelii*, a European strain, which is found in UK. Can have an associated peripheral neuropathy.
- **All stages of LB (even late stage) are treatable with antibiotics.** Most patients recover well, but time to recovery depends in part on degree of tissue damage sustained prior to treatment.

UK and overseas acquired Lyme, England & Wales; 1997-2011

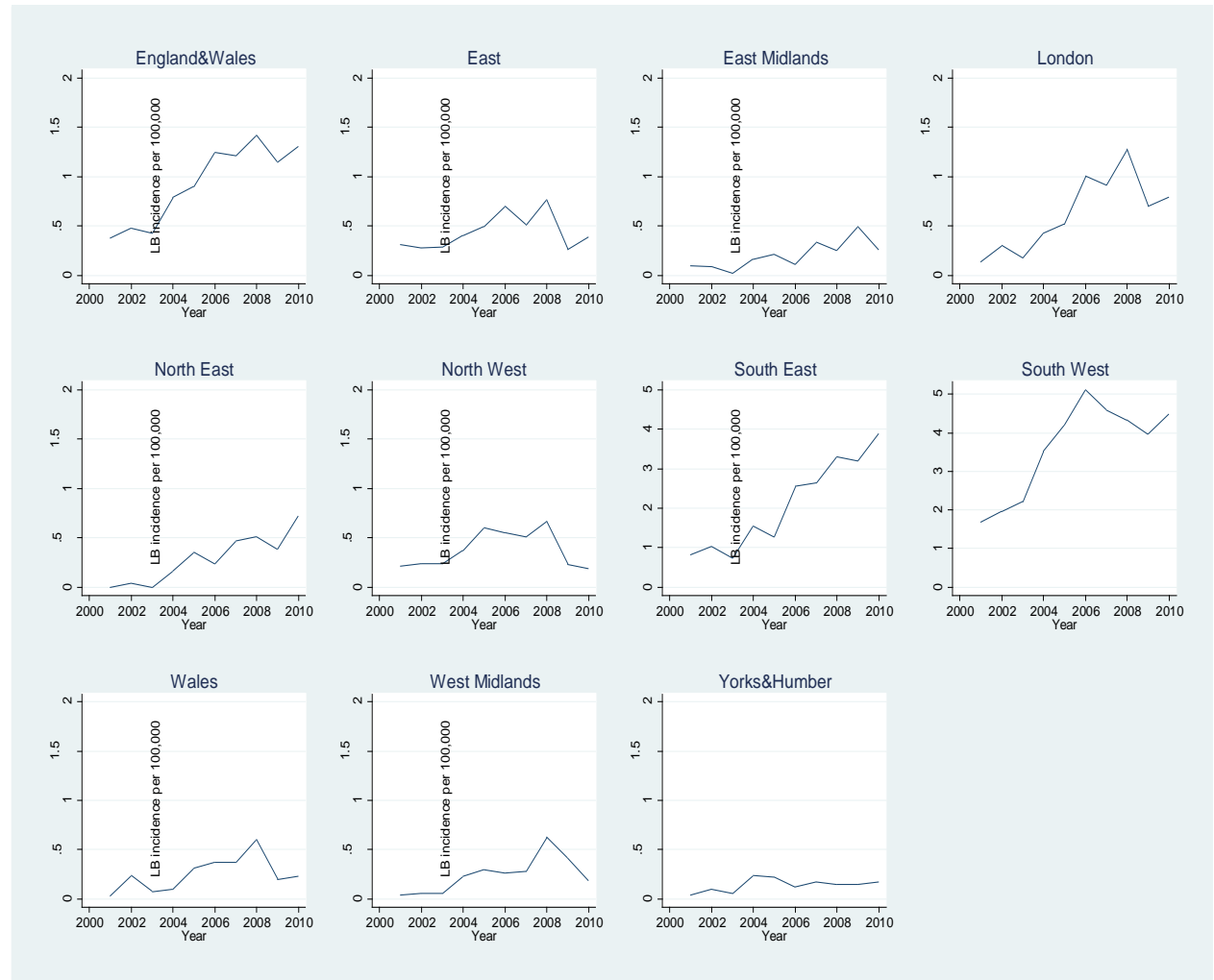


UK and overseas acquired Lyme; 2001 - 2011

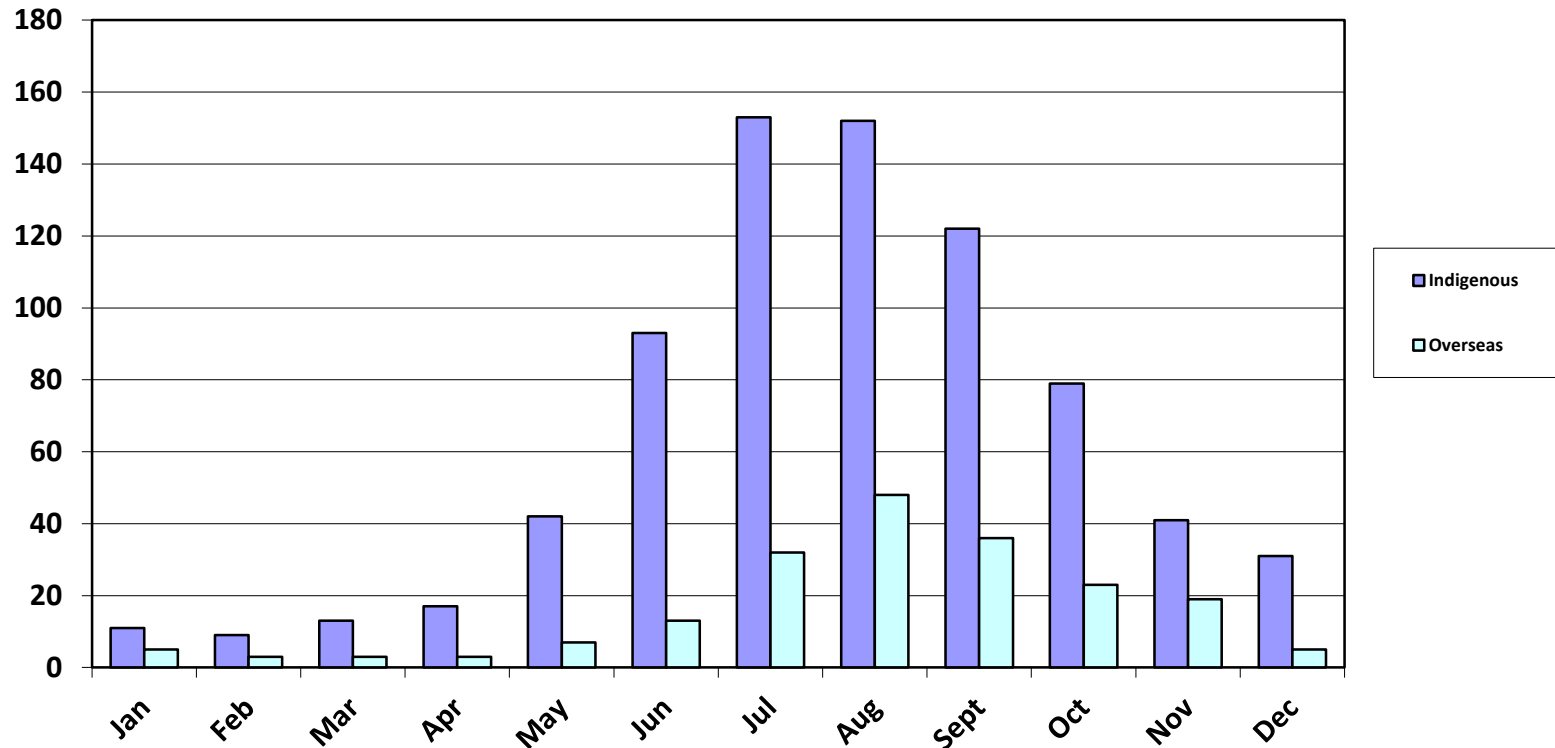
Year	Acquired in the United Kingdom (%)	Acquired abroad (%)	Total cases	Mean annual rate per 100,000 population*
2001	215 (81)	53 (20)	268	0.50
2002	269 (79)	71 (21)	340	0.64
2003	271 (90)	31 (12)	302	0.55
2004	425 (85)	75 (15)	500	0.95
2005	488 (82)	107 (18)	595	1.10
2006	677 (88)	91 (12)	768	1.46
2007	705 (88)	92 (12)	797	1.49
2008	722 (89)	91 (11)	813	1.52
2009	673 (78)	190 (22)	863	1.59
2010	741 (82)	164 (18)	905	1.64
2011	761 (79)	197 (21)	958	1.73
Total	5,947	1,161	7,108	-

Regional Annual Trends; 2001 - 2010

- Substantial annual increases in reference laboratory test referrals
- Increase in the number of early infections
- Attributable to greater professional and public awareness.
- Absence of a dramatic increase in overall case reports reflects diagnostic consistency and suggests that tick awareness messages from DH, PHE, PHW and other responsible organisations are well targeted and effective.

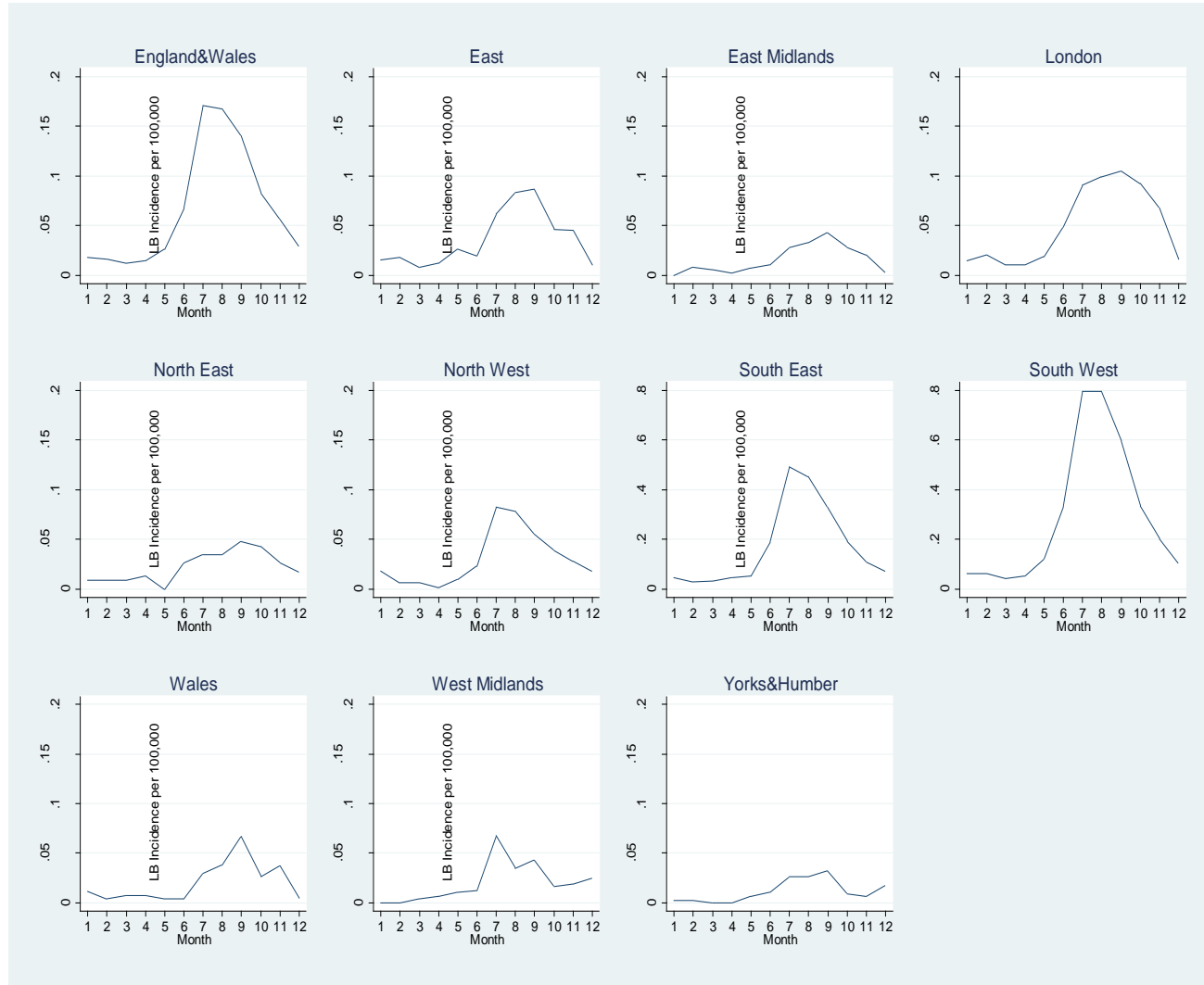


Monthly indigenous and overseas reports of Lyme borreliosis in England and Wales; 2011



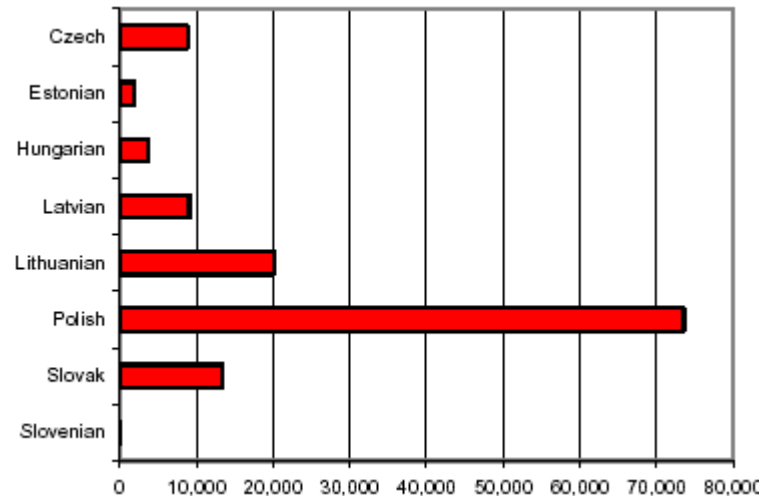
Regional Seasonality; 2001-2010

- Mean monthly incidence remains low Jan-April (range 0 – 0.63/100,000)
- May-June peak incidence ranges from 0.043 in East Midlands to 0.798/100,000 in South West
- Overall monthly incidence declines to lower levels in Nov & Dec
- Peak incidence varies between regions; July in NE, SE, W Mids & SW; peaks in Sept for remainder



Overseas acquired Lyme

An increasing number of infections have been reported in non-UK nationals, many of whom have returned to their home countries, often during peak holiday periods. Polish nationals are strongly represented in this category.



Summary

- The number of cases of laboratory-confirmed Lyme borreliosis (LB) in England and Wales in 2011 has shown a 2.8% (n=21) increase in reports compared with 2010
- The overall rate (1.73/100,000 population) remains low compared with most other western European countries
- There has been an increase in the number of early and asymptomatic cases, suggesting heightened professional and public awareness of both the risk of acquiring, and early symptoms of LB
- More patients presented with mild symptoms having received appropriate early antibiotic treatment, usually doxycycline, which has ablated the clinical presentation
- The age, sex and geographical distributions of cases remain comparable with those of previous years
- The seasonality of reported cases remains similar to, and consistent with that of previous years
- Except where additional exposure information is available, it is assumed that most UK acquired cases of LB will have received a tick bite close to their place of residence
- The proportion of travel related cases has risen from 18% in 2010 to 21% in 2011, an increase of 20% on 2010

Lyme borreliosis – antibody tests

- Antibody response can take some weeks to develop, so a **negative test doesn't exclude *early* infection.**
- Migrating through tick's gut, OspC binds a tick salivary protein, coating Borrelia
- Spirochaetes reproduce around bite area
- Interact with local dendritic cells → specific immune response
- Resulting in EM skin rash, characteristic of LD
- As infection progresses, additional antibodies appear to other components of the organism
- Different spp. give different patterns of antibody response
- **Seronegativity is very rare in patients who have late stage infection.**
- Additional tests should be performed and other possible diagnoses carefully considered before accepting a diagnosis of seronegative late Lyme borreliosis.

Lyme borreliosis – a few myths

- ***“A mysterious, little-known, little-understood infection”***

Estimated over \$200 million spent on research in past 30 years; genome sequenced; huge amount of data on ecology, biology, clinical presentations, treatment and outcomes

- ***“Difficult to diagnose”***

It isn't, as long as you think about it as a possibility! Common clinical presentations are well documented. Good quality lab tests available; highly sensitive except in early infection.

- ***“Difficult to treat”***

It is easily treated with relatively short courses of inexpensive generic antibiotics

- ***“Major cause of long-term illness”***

It rarely causes long-term active infection ***even without treatment***

- ***“European-acquired LB differs from American LB”***

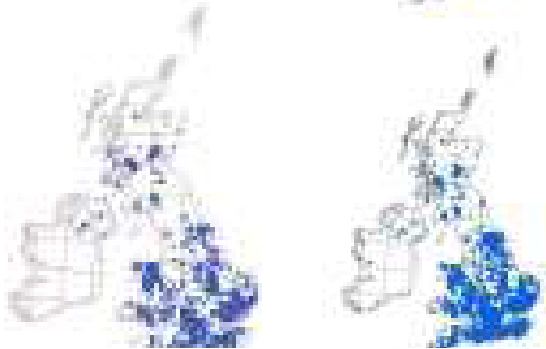
European acquired illness can have some additional clinical features, but overall the disease pictures and treatment requirements are similar

Increase in UK Deer populations; 2000 - 2007

Muntjac Deer



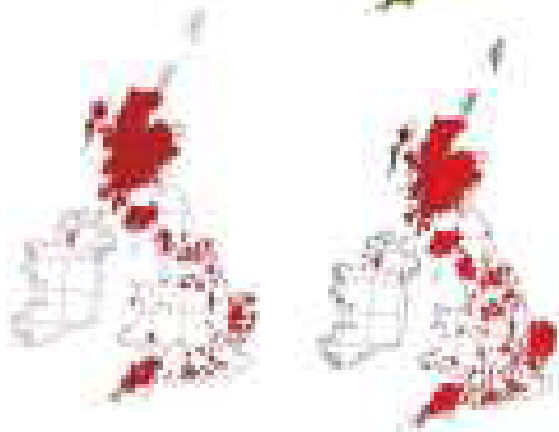
Fallow Deer



Roe Deer



Red Deer



➤ Deer are immune to Infection by *B. burgdorferi* but support tick populations

Potential hotspots in UK:
➤ Look for “Deer” road signs!

More information:

❑ [Public Health England:](#)

<http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/LymeDisease/>

❑ *EUCALB website for good ecological information:*

http://www.meduni09.edis.at/eucalb/cms_15/index.php





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