

Real-time laboratory surveillance of sexually-transmissible infections in Marseille university hospitals reveals rise of gonorrhoea, syphilis and human immunodeficiency virus seroconversions in 2012

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Real-time systematic monitoring of the number of infections diagnosed in our clinical microbiology laboratory in Marseille recently drew attention to the fact that the incidence of gonorrhoea was 10-fold greater from September through December 2012 than during same months of previous years. We also found an increase in the annual incidence of syphilis and human immunodeficiency virus seroconversion. Our system allowed timely identification of an increase in sexually-transmitted infections in Marseille for the whole year of 2012.

Routine laboratory surveillance in Marseille, France identified a rise in the number of diagnosed gonococcal infections in the last quarter of 2012. We therefore analysed the annual incidence data of sexually transmitted infections (STI) and noted an increase not only in the incidence of gonorrhoea but also of syphilis and human immunodeficiency virus (HIV) infections.

Laboratory surveillance in Marseille

Systematic monitoring of the number of infections diagnosed through tests performed by the laboratories is a new monitoring mode to detect seasonality and variations in the incidence of infectious and contagious diseases [1]. We have since 2002 been using such a system in our clinical microbiology laboratory [2], which is the sole laboratory for Marseille University hospitals and performs annually for the diagnosis of infections approximately 145,000 serological tests, 200,000 PCR tests, as well as cultures of bacteria, yeasts or viruses from 220,000 samples. Our computer tool gives a signal when the weekly incidence of a

given disease is greater than the mean plus two standard deviations [2].

Marseille is the second largest city in France with about 850,000 inhabitants in the city itself and 1,560,000 inhabitants in the entire Marseille urban unit (2.5% of the metropolitan population in France). The annual activity of Marseille University hospitals includes about 890,000 consultations, 125,000 admissions, 151,000 persons seen in emergency wards, and 112,000 hospitalised patients. No data on the recent incidence or prevalence of diagnosed STI are available for other laboratories that cover our geographical area, nor, to our best knowledge, are any national data.

Increase in diagnosed sexually transmitted infections

Seven cases of gonorrhoea were diagnosed in September 2012, whereas the mean number was 1.2 cases (range: 0–3 cases) from January 2005 through August 2012 (Figure, panel A), which prompted us to investigate the data from our surveillance system for other STIs. This analysis confirmed that there was an increase in the annual incidence of serologically diagnosed active syphilis, which was 2.7-fold higher in 2012 (164 cases) compared to the period from 2005 to 2011, during which it ranged from 44 to 84 (mean: 62 cases) (Figure, panel B). Concurrently, the annual number of HIV seroconversion was 1.8-fold higher in 2012 (16 cases) than during the period from 2005 to 2011 (mean: 9 cases) (Figure, panel C). In addition, we confirmed a 10-fold increase in the number of gonorrhoea cases diagnosed from September to December 2012

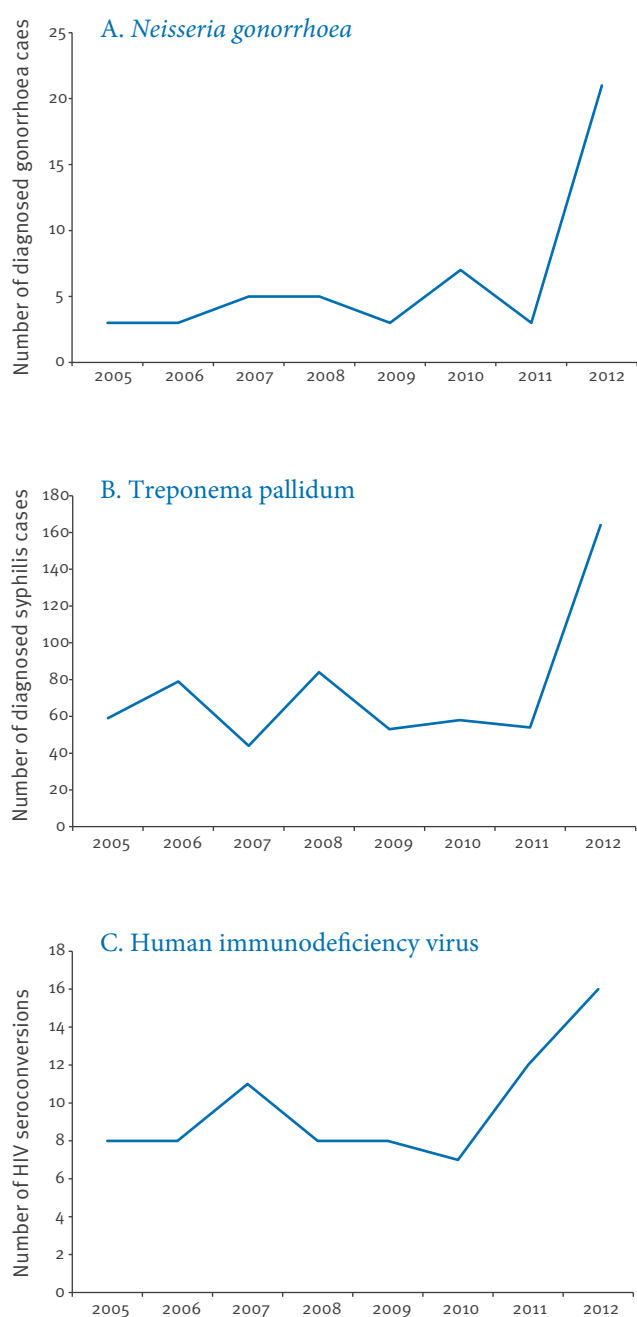
compared with the same months of the seven previous years. Regarding *Chlamydia trachomatis* infections, we have not noticed any significant increase in numbers, but our monitoring for this particular pathogen only started in January 2011.

There have not been any recent changes in testing procedures for STI in our laboratory.

We looked at the sex and age of all patients who experienced gonorrhoea, active syphilis or HIV

FIGURE

Culture isolation of *Neisseria gonorrhoeae* (A), serology indicating active syphilis (B) and primary infection with human immunodeficiency virus (C), Marseille, 2005–2012



HIV: human immunodeficiency virus.

seroconversion. It was found that they were mostly young men. Indeed, in 2012, 38 of 47 gonorrhoea cases were diagnosed in men whose mean age (\pm standard deviation) was 29 ± 10 years (range: 16–51 years); 89% of syphilis were diagnosed in men whose mean age was 46 ± 14 years (range: 21–87 years); and all 16 cases diagnosed with HIV seroconversion were men whose mean age was 39 ± 15 years (range: 21–72 years) and among whom 6 of 16 were younger than 30 years. Among persons who experienced HIV seroconversion, we found a significant rise of the male/female sex ratio in the period from 2005 to 2010 (37 men among 50 cases) and the period 2011 and 2012 (27 men among 28 cases) ($p=0.014$), and a 2.2-fold rise of the annual number of men having sex with men who experienced HIV seroconversion in the period from 2005 to 2010 (31 cases) and the period 2011 and 2012 (23 cases).

Trends in other countries

Interestingly, other countries in Europe also described recent increases in the incidence of several STIs, for instance in England, Germany and Sweden, particularly among MSM [3]. In France, a 52% increase in gonorrhoea was described between 2008 and 2009 [4], but not in the following years. In Europe, a rise of gonorrhoea notifications has been reported in several countries [3]. In England, the increase was 25% in the general population, and as high as 61% among men who have sex with men among whom 42% of diagnoses were in those aged 25–34 years [5]. The number of syphilis cases in France nationally declined in 2008 and 2009 after an earlier increase in 2007 [6], which is in contrast to our data for Marseille. In England, a 10% increase in syphilis was noted in 2011, reaching 28% among young men who have sex with men [5]. In Germany, syphilis cases rose by 22% in 2011, mainly in men [7]. Finally, regarding HIV, a significant increase of the number of positive serology results was reported in some regions of metropolitan France between 2007 and 2011 [8]. The estimated yearly HIV incidence among MSM was 3.8% person-years in France in 2009 and 2.5% in Europe, North America and Australia for the period 1995–2005 [9,10].

In conclusion, our monitoring system based on laboratory diagnoses, which mimics the system implemented in England and Wales can detect early changes in the incidence of STIs. Such real-time systematic laboratory surveillance of infectious diseases is critical for an accurate appreciation of incidence and for appropriate prevention and treatment, and is currently lacking in France. In addition, among the STIs analysed here, notification is only mandatory for HIV infection. Finally, our system is unique in that it can pick up signals in real time, which allowed analysis of the full 2012 data already in January 2013 and led to the identification of the increasing trend in STIs in Marseille.

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Authors' contributions

DR, FG and PC conceived the study and wrote the manuscript. DR, PC, FG, SB, CT and/or AS provided and analysed the data.

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