Eastern European Network for Sexual and Reproductive Health: Optimization and Quality Assurance of Management of Sexually-transmitted Infections in Eastern European Countries

Marius Domeika[1] and Magnus Unemo[2], on behalf of the Eastern European Network for Sexual and Reproductive Health (EE SRH Network)

[1]Department of Control and Prevention of Communicable Diseases, Uppsala County Council and Forum Health MD, Uppsala, and [2]World Health Organization Collaborating Centre for Gonorrhoea and other Sexually-transmitted Infections, Swedish Reference Laboratory for Pathogenic Neisseria, Department of Laboratory Medicine, Microbiology, Örebro University Hospital, Örebro, Sweden. E-mail: marius.domeika@gmail.com

During the last 20 years, Eastern European (EE) countries have undergone major changes, including the development of their national health care. However, sexually transmitted infections (STIs) remain an unrecognized, significant public health problem in the majority of EE countries. The World Health Organization (WHO) in its "Global strategy for prevention and control of STIs for 2006–2015" stated that it is crucial to increase the commitment of national governments and to use integrated approaches in order to address the problem (1).

The aim of the present paper is to report on the activities, products and implementations at the national level performed by the Eastern European Network of Sexual and Reproductive Health (EE SRH Network). The EE SRH Network, a group of international multidisciplinary collaborators, was established in 2007 to endorse the work of the WHO by promoting cooperation at both national and international levels, by surveying, evaluating and developing internationally acknowledged consensus approaches for the management of STI (2–4). At present, the EE SRH Network includes 16 EE countries (Fig. 1).

It has long been recognized that laboratory testing plays an essential role in patient management and epidemiological surveillance of STIs. Results of national surveys (5–18), conducted in countries included in the EE SRH network, demonstrate that individual tests and approaches used to establish a diagnosis often do not comply with international standards. For example, serological tests are used to diagnose genital chlamydial infections in many EE countries, while screening for gonococcal infections in women is largely conducted by using microscopy of Gram-stained cervical smears. In addition, few laboratories use type-specific herpes simplex virus (HSV) serology for the diagnosis of genital herpes (19).

In collaboration with international experts, efforts have been made to harmonize methods used for the laboratory diagnosis of STIs with those recommended by international organizations, such as the International Union against STIs (IUSTI), the WHO, and the US Centers for Disease Control and Prevention (CDC). Fourteen EE countries have approved and published consensus guidelines regarding the laboratory diagnostics of STIs. These guidelines were developed by the network participants during many EE SRH network meetings, based on international guidelines and using evidence-based principles. This approach stimulated direct communication between leading STI experts from "East" and "West", resulting in consensus documents, which were first published internationally (20–26) and then subsequently adopted and published at the national level (2–4).

It is recognized that both the quality of test kits and the implementation of quality assurance systems contribute to the confidence in results and the reputation of diagnostic services. STI diagnostic test kits manufactured in EE countries, which are more cost-effective than international kits, have rarely been internationally validated. The EE SRH network has conducted a number of studies comparing Russian-manufactured tests for the detection of the STI agents, namely *Chlamydia trachomatis* (27), *Neisseria gonorrhoeae* (28, 29), *Mycoplasma genitalium* (30) and *Trichomonas vaginalis* (31) with internationally acknowledged methods, which yielded promising results. In contrast, media used for the culture of gonococci, and serological testing, namely the microprecipitation reaction (analogue to the Venereal Disease Research Laboratory (VDRL) test), used for serological screening for syphilis, both demonstrated the need for urgent quality improvements (32).

It is clear that the regional biomedical industry has the potential for producing reliable reagents and tests kits at affordable prices; however, strict quality assurance is crucial (27–32). Comprehensive evaluations of locally manufactured tests should be conducted according to internationally accepted guidelines as a prerequisite to marketing products in the region. In addition, other issues related to laboratory quality assurance have emerged as a high priority for many EE countries. The establishment of an extensive external quality assurance

Fig. 1. A map showing the Eastern European countries.

(EQA) programme for the serological diagnosis of syphilis in Russia has revealed a number of difficulties, including lack of willingness to participate and high rates of false-positive/negative results (33). Such programmes should be extended to include all laboratory testing, with appropriate sanctions being implemented for those laboratories that consistently fail to provide satisfactory results.

Another factor that is necessary to assure high-quality laboratory practices is the establishment of national or regional reference laboratories for STIs, preferably supported and financed by the state authorities. At present, there are no such institutions in EE. Such institutions could provide a source of expertise to support national or regional STI initiatives, perform reference testing and collect surveillance data. In addition, these laboratories could maintain EQA programmes, supervise updating of national STI laboratory guidelines and establish international collaborations (34).

Only a minority of the EE SRH Network countries have previously adopted the international standards for quality assurance systems, e.g. International Organization for Standardization (ISO) 15189. The network is encouraging the adoption of these standards in all remaining network countries. A standard protocol for accreditation of laboratories has been developed, adopted and published in both Russia and Belarus (2).

The emergence and spread of antimicrobial resistance (AMR) in *N. gonorrhoeae* is recognized as a major concern globally. However, in the majority of the EE countries AMR testing of *N. gonorrhoeae* isolates is performed only occasionally, because gonococcal culture is rarely available (35). The use of microscopy or *nucleic acid amplification tests* (*NAATs*) only for the diagnosis of STIs, and the complexity of the transportation of viable gonococci to the laboratory diminishes the possibility of culture usage. AMR surveillance for *N. gonorrhoeae* in the EE SRH network countries has been initiated, according to WHO methodology, with expertise and support from the WHO Collaborating Centre for Gonorrhoea and other STIs, Swedish Reference laboratory for Pathogenic Neisseria, Örebro University hospital (36–40). EE SRH countries participating are supported by provision of training, WHO quality control strains and reagents to enable them to initiate collection of *N. gonorrhoeae* strains for AMR testing. Successful collaboration with the Russian Reference Centre for STIs resulted in availability of the standardized data from Russia and several international publications (38–39). For the third consecutive year Belarus routinely collects isolates of gonococci and performs their AMR analysis under the supervision of the WHO Collaborating Centre for Gonorrhoea and other STIs in Örebro (40). Isolates from Poland and Estonia are also currently being analysed.

In addition to laboratory guidelines, STI patient management guidelines have been developed within the framework of the EE SRH network, in Lithuania, Bulgaria, Russia and Belarus (2).

Finally, most EE countries inherited complicated and labour-intensive communicable disease surveillance systems. STI surveillance is largely suboptimal, owing to old-fashioned, non-standardized, paper-based surveillance systems and the absence of computer-based statistical tools (41). Furthermore, legal constraints have been shown to be a potential barrier for good STI surveillance. Surveillance systems for STIs differ from one country to another depending on the availability of laboratory services and the accessibility of healthcare-provider institutions. In order to standardize and quality assure data collection and analysis, we have devised an electronic computer-based system for communicable disease surveillance that has been implemented in Lithuania (42). Implementation of an identical system is currently in progress in Belarus.

In conclusion, EE and its healthcare systems are experiencing significant change. Modern technologies, sophisticated assays and diagnostic strategies are being introduced. Collaboration with countries with well-functioning healthcare structures is therefore crucial. Since its formation, the EE SRH Network has been effective in facilitating this process.

Acknowledgements

The present work was supported by grants from the East Europe Committee of the Swedish Health Care Community, Swedish International Development Cooperation Agency (SIDA) and Swedish Institute (SI).

References

1. Ndowa F. The global strategy for prevention and control of sexually transmitted infections. Proceedings of the 4th Annual Meeting of the Eastern European Network for Sexual and reproductive Health (EE SRH Network). Uppsala: Uppsala University; 30 May–3 June, 2009.
2. Domeika M, Savicheva A, Sokolovskiy E, Ballard R, Unemo M; Eastern European Network for Sexual and Reproductive Health (EE SRH Network). Quality enhancements and quality assurance of laboratory diagnosis of sexually transmitted infections in Eastern Europe. Int J STD AIDS 2009; 20: 365–367.
3. Domeika M, Unemo M, Ballard RC, on behalf of the Eastern European Network for Sexual and Reproductive Health (EE SRH Network). Laboratory support for the diagnosis and surveillance of sexually transmitted infections (STIs) in Eastern Europe. Euro Surveill 2009; 14: pii=19340. http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19340.
4. Domeika M, Savicheva A, Sokolovskiy E, Ballard R, Unemo M. Guidelines for laboratory diagnosis of Neisseria gonorrhoeae infections in Eastern European countries – results of an international collaboration. Euro Surveill 2007; 12: pii=3326 http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=3326.
5. Pöder A, Brilene T, Domeika M. Estonian experiences in the organization of prevention and management of sexually transmitted infections. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 67–68 (abstract).
6. Domeika M, Kligys G, Butylkina R, Vagoras A, Marciukaitiene I, Mereckiene J, et al. Optimization of the control and prevention of sexually transmitted infections in Lithuania: results of an international collaboration. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 64–65 (abstract).
7. Deák J, Pappné Ábrók M, Kele B, Domeika M. Preliminary results of a survey on sexually transmitted disease management in Hungary. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 115 (abstract).
8. Jacobsone I, Pirsko J, Rubins A, Domeika M. Management of sexually transmitted infections in Latvia. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 81–82 (abstract).
9. Babayan K, Domeika M. Management of sexually transmitted infections in Armenia. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 80 (abstract).
10. Ismailov R, Domeika M. Epidemiologic surveillance, diagnosis and treatment of sexually transmitted infections in Azerbaijan. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 67 (abstract).
11. Navrotsky A, Pancratov V, Zhurauskaya L, Siarheichyk N, Unemo M, Domeika M. Management of sexually transmitted infections in Belarus: preliminary results of a national survey. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 79 (abstract).
12. Kasymov O, Kasymov A, Domeika M. Management of sexually transmitted infections in Tajikistan. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 78–79 (abstract).
13. Galdava G, Kvlividze O, Kituashvili T, Domeika M. Epidemiological specifics of STIs in Georgia. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 77–78 (abstract).
14. Mavrov G, Kochetova N, Domeika M. Optimisation of the management of sexually transmitted infections in the Ukraine. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 76–77 (abstract).
15. Chudomirova K, Domeika M. Results of a management survey of sexually transmitted diseases in Bulgaria: legal aspects and epidemiology. 23rd IUSTI-Europe Conference on Sexually Transmitted Infections, 11–14 October 2007, Cavtat, Croatia, p. 76 (abstract).
16. Usupova D, Danilenko N, Unemo M, Domeika M. Sexually transmitted infections in Kyrgyzstan. 24th IUSTI-Europe Conference on Sexually Transmitted Infections, 4–6 September 2008, Milan, Italy, p. 85–86 (abstract P59).
17. Askarova G, Uskenbajeva A, Emeljanov V, Bauetdinov R, Alzibajev T, Unemo M, Domeika M. Current situation regarding diagnosis of sexually transmitted infections (STIs) in Kazakhstan. 24th IUSTI-Europe Conference on Sexually Transmitted Infections, 4–6 September 2008, Milan, Italy, p. 85 (abstract P57).
18. Ibragimov S, Izvekova O, Unemo M, Domeika M. Characterisation of the epidemiological situation regarding sexually transmitted infections (STIs) in Uzbekistan. 24th IUSTI-Europe Conference on Sexually Transmitted Infections, 4–6 September 2008, Milan, Italy, p. 85 (abstract P58).
19. Domeika M, Babayan K, Ismailov R, Shimanskaya I, Chudomirova K, Brilene T, et al. Survey of diagnostic services for genital herpes in fourteen countries in Eastern Europe. Acta Derm Venereol 2011 91: 333–336.
20. Savicheva A, Sokolovsky E, Frigo N, Priputnevich T, Brilene T, Deák J, et al. Guidelines for laboratory diagnosis of Neisseria gonorrhoeae in East-European countries. Part 1: gonorrhoea, sampling, and microscopy for diagnosis. Acta Medica Lituanica 2007; 4: 65–74.
21. Savicheva A, Sokolovsky E, Frigo N, Priputnevich T, Brilene T, Deák J, et al. Guidelines for laboratory diagnosis of Neisseria gonorrhoeae in East-European countries. Part 2: culture, non-culture methods, determination of antibiotic resistance, and quality assurance. Acta Medica Lituanica 2007; 4: 123–134.
22. Domeika M, Savicheva A, Sokolovskiy E, Frigo N, Brilene T, Hallén A, et al.; EE SRH Network. Guidelines for the laboratory diagnosis of Chlamydia trachomatis infections in East European countries. J Eur Acad Dermatol Venereol 2009; 23: 1353–1363.
23. Sokolovskiy E, Frigo N, Rotanov S, Savicheva A, Dolia O, Kitajeva N, et al.; EESRH Network. Guidelines for the laboratory diagnosis of syphilis in East European countries. J Eur Acad Dermatol Venereol 2009; 23: 623–632.
24. Domeika M, Zhurauskaya L, Savicheva A, Frigo N, Sokolovskiy E, Hallén A, et al.; Eastern European Network for Sexual and Reproductive Health. Guidelines for the laboratory diagnosis of trichomoniasis in East European countries. J Eur Acad Dermatol Venereol 2010; 24: 1125–1134.
25. Shipitsyna E, Savicheva A, Solokovskiy E, Ballard RC, Domeika M, Unemo M, et al.; EE SRH Network. Guidelines for the laboratory diagnosis of Mycoplasma genitalium infections in East European countries. Acta Derm Venereol 2010; 90: 461–467.
26. Domeika M, Bashmakova M, Savicheva A, Kolomiec N, Sokolovskiy E, Hallen A, et al.; Eastern European Network for Sexual and Reproductive Health (EE SRH Network). Guidelines for the laboratory diagnosis of genital herpes in eastern European countries. Euro Surveill 2010; 15 (44).
27. Shipitsyna E, Zolotoverkhaya E, Agné-Stadling I, Krysanova A, Savicheva A, Sokolovsky E, et al. First evaluation of six nucleic acid amplification tests widely used in the diagnosis of Chlamydia trachomatis in Russia. J Eur Acad Dermatol Venereol 2009; 23: 268–276.
28. Shipitsyna E, Guschin A, Maximova A, Tseslyuk M, Savicheva A, Sokolovsky E, et al. Comparison of microscopy, culture and in-house PCR and NASBA assays for diagnosis of Neisseria gonorrhoeae in Russia. APMIS 2008; 116: 133–138.

29. Shipitsyna E, Zolotoverkhaya E, Hjelmevoll SO, Maximova A, Savicheva A, Sokolovsky E, et al. Evaluation of six nucleic acid amplification tests used for diagnosis of Neisseria gonorrhoeae in Russia compared with an international strictly validated real-time porA pseudogene polymerase chain reaction. J Eur Acad Dermatol Venereol 2009; 23: 1246–1253.
30. Shipitsyna E, Zolotoverkhaya E, Dohn B, Benkovich A, Savicheva A, Sokolovsky E, et al. First evaluation of polymerase chain reaction assays used for diagnosis of Mycoplasma genitalium in Russia. J Eur Acad Dermatol Venereol 2009; 23: 1164–1172.
31. Shipitsyna E, Zolotoverkhaya E, Chen CY, Chi KH, Grigoryev A, Savicheva A, et al. Evaluation of polymerase chain reaction assays for the diagnosis of Trichomonas vaginalis infection in Russia. J Eur Acad Dermatol Venereol 2012 Jun 1. doi: 10.1111/j.1468-3083.2012.04593.x. PMID: 22672184 [E-pub ahead of print]
32. Shimanskaya I, Zhurauskaya L, Pankratov O, Unemo M, Ballard RC, Domeika M. Evaluation of three serological tests manufactured in Belarus for the diagnosis of syphilis. Acta Derm Venereol 2011; 91: 299–302.
33. Frigo N. First experience of external laboratory quality control for STIs: Russian Federal System for syphilis control. Proceedings of the 4th Annual Meeting of the Eastern European Network for Sexual and reproductive Health (EE SRH Network). Uppsala: Uppsala University; 30 May–3 June, 2009.
34. Ballard R. The Laboratory and the STI Surveillance. Proceedings of the 4th Annual Meeting of the Eastern European Network for Sexual and reproductive Health (EE SRH Network). Uppsala: Uppsala University; 30 May–3 June, 2009.
35. Unemo M. Neisseria gonorrhoeae (GC) antimicrobial resistance (AMR) surveillance – global perspective and prospects in Eastern Europe. Proceedings of the 4th Annual Meeting of the Eastern European Network for Sexual and reproductive Health (EE SRH Network). Uppsala: Uppsala University; 30 May–3 June, 2009.
36. Unemo M, Shipitsyna E, Domeika M; Eastern European Sexual and Reproductive Health (EE SRH) Network Antimicrobial Resistance Group. Gonorrhoea surveillance, laboratory diagnosis and antimicrobial susceptibility testing of Neisseria gonorrhoeae in 11 countries of the eastern part of the WHO European region. APMIS 2011; 119: 643–649.
37. Unemo M, Shipitsyna E, Domeika M; Eastern European Sexual and Reproductive Health (EE SRH) Network Antimicrobial Resistance Group. Recommended antimicrobial treatment of uncomplicated gonorrhoea in 2009 in 11 East European countries: implementation of a Neisseria gonorrhoeae antimicrobial susceptibility programme in this region is crucial. Sex Transm Infect 2010; 86: 442–444.
38. Kubanova A, Frigo N, Kubanov A, Sidorenko S, Lesnaya I, Polevshikova S, et al. The Russian gonococcal antimicrobial susceptibility programme (RU-GASP) – national resistance prevalence in 2007 and 2008, and trends during 2005–2008. Euro Surveill 2010; 15 (14).
39. Kubanova A, Frigo N, Kubanov A, Sidorenko S, Priputnevich T, Vachnina T, et al. National surveillance of antimicrobial susceptibility in Neisseria gonorrhoeae in 2005–2006 and recommendations of first-line antimicrobial drugs for gonorrhoea treatment in Russia. Sex Transm Infect. 2008; 84: 285–289.
40. Glazkova S, Golparian D, Titov L, Pankratova N, Suhabokava N, Shimanskaya I, et al. Antimicrobial susceptibility/resistance and molecular epidemiological characteristics of Neisseria gonorrhoeae in 2009 in Belarus. APMIS 2011; 119: 537–542.
41. Fisenko E. Surveillance and surveillance systems for communicable diseases and STIs in Eastern Europe. Proceedings of the 4th Annual Meeting of the Eastern European Network for Sexual and reproductive Health (EE SRH Network). Uppsala: Uppsala University; 30 May–3 June, 2009
42. Domeika M, Kligys G, Ivanauskiene O, Mereckiene J, Bakasenas V, Morkunas B, et al. Implementation of a national electronic reporting system in Lithuania. Euro Surveill 2009; 14 (13).

If one of the authors (Marius Domeika) would like to invest in another carrier he has an unknown skill as a singer. The photo is taken from a congress in Moscow where he "performed". (Comment from the Editor.)