Controversies and challenges tackling illegal drug related communicable diseases (CD)

Prof. SAULIUS ČAPLINSKAS

Director, Centre for Communicable Diseases and AIDS;
Professor, Mykolas Romeris University,
Vilnius, Lithuania

What do we know about the incidence and tendencies of psychoactive substance (PAS) use (or drug use) related communicable diseases (DRCD)?

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Psychoactive Substance Use Related CD Transmission Scheme

Blood-born infections

(STI) (Syphilis, gonorrhea, Chlamydia, VHB)

Diarrhea, influenza, other behavioral related CD

Anthrax

VHA

Non-sterile injecting equipment

Weakened immune system

TB

Favourable conditions for development of AM resistance

Sexual behaviour

Mental disorders

Lifestyles

(VHC, HIV)

PAS use

Accessib. to HC services

(socioeconomic conditions, failure to keep sanitary standards)
Interface of Overlapping Risk Groups and Epidemics

Breaking existing rules and social norms

Complex of related diseases and social problems
Spread of drug-related communicable diseases (DRCD) in society

**Prof. Saulius Čaplinskas, MD, PhD**

- **Drug user** suffering from following DRCD: VH, HIV, STI, TB, ...
- Drug using and/or sexual partners; other close contacts
- Their sexual partners and other close contacts

*General population*
Main causes of death in the world

58 mln. Deaths each year

- Cardiovascular diseases 16.7 million
- Infectious diseases 14.9 million
- Oncological diseases 7.1 million
- Injuries 5.2 million
- Asthma and chronic obstructive pulmonary disease 3.0 million
- Other causes

Of 58 mln. deaths each year about 15 million (> 25%) deaths occur due to infectious diseases (ID)

Majority of deaths which occur due to such diseases as cancer, circulatory, respiratory or digestive system disorders are caused by ID

Source: WHO, 1999

Leading causes of global deaths from infectious diseases

- Respiratory infections: 4.3 million
- Diarrheal diseases: 2.5 million
- HIV/AIDS: 1.8 million
- Tuberculosis: 1.3 million
- Malaria: 0.8 million
- Meningitis: 0.3 million
- Pertussis: 0.2 million
- Measles: 0.2 million
- Hepatitis B: 0.1 million
- Other infectious diseases: 1.2 million

No. of Deaths (million)
Most HIV-affected countries in Africa

Rates of HIV positive individuals in the countries:

1 of 4

1 of 3

1 of 10
HIV prevalence and trends
1996-2001

Which country saw the highest reported HIV morbidity in the world in 2001?

Prevalence among adults

No data available
Newly recorded HIV cases in the Baltic States and Poland in 2000–2010

In 2008, HIV prevalence rate per 100,000 population in Lithuania:

- 14 times lower than in Estonia,
- 5 times lower than in Latvia,
- 3 times lower than in Belarus,
- 20 times lower than in Kaliningrad Region of Russian Federation

Source: ECDC

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Incidence of HIV infection by the geographical distribution in the WHO European Region, 2004-2011

Source: ECDC
HIV prevalence and incidence rate in Lithuania (per 100 000 population)

On 01.01.2013 a total 2060 HIV cases were diagnosed

69% of IDUs

HIV outbreak in Alytus prison

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt

Prof. Saulius Čaplinskas, MD, PhD
HIV / AIDS in Prisons: General Impact

Per year, about 17 - 20 thousand of people go through Lithuanian imprisonment system.

At any time of 10,000 people in Lithuanian prisons, 400 are HIV positive; 20% are IDUs.

Infected outside prison walls

Infected in prison

New inmates

Released inmates

Drug users’ partners

Sexual partners

Source: Prison department

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Men/ women ratio of new HIV infection cases and HIV cases excluding IDU’s in the WHO European region (East) 2011 (N=24 773)

Can an HIV infected mother give birth to a healthy child?

Source: ECDC
Perinatal (Mother-to-Child) Transmission of HIV

- 20 HIV positive pregnant women
  - 1 baby gets infected during pregnancy
  - 3 babies get infected during delivery
  - 1 baby who receives mixed feeding is infected
  - 15 will be healthy, although breastfed

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Number of HIV Mother-to-Child Transmission Cases 01.01.2012

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuania</td>
<td>2</td>
</tr>
<tr>
<td>Latvia</td>
<td>41</td>
</tr>
<tr>
<td>Estonia (01.01.2011)</td>
<td>40</td>
</tr>
<tr>
<td>Poland</td>
<td>146</td>
</tr>
<tr>
<td>Belarus</td>
<td>198</td>
</tr>
<tr>
<td>Kaliningrad region</td>
<td>70</td>
</tr>
</tbody>
</table>

83 cases HIV positive woman delivery in Lithuania (01.01.2013)

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt
Changing natural history of HIV disease - integrated approach to HIV treatment

- HIV can be suppressed with combined antiretroviral therapy (ART), using three or more anti-retroviral drugs (ARVs).

Source: WHO Fact sheet N°360, November 2012
Proper use of ART

Reduces viral load in the body

Reduces the likelihood of viral transmission

TREATMENT for PREVENTION

- If an HIV-positive partner in a couple undergoes ART treatment, the likelihood of HIV uninfected partner becoming infected through sexual intercourse is greatly reduced.
Epidemiological Differences Between ID and AIDS

Why HIV remains an ever-increasing problem?

New cases (Incidence)

Prevalence

Treatment

Deaths

People dying of AIDS

People living with AIDS

Asymptomatic Infection

Ways to cure HIV:

• Virus eradication – “a sterilizing cure”

• Continuous suppression of viral replication without eradicating them – “functional cure”.

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Started ART in Lithuania

Newly diagnosed cases of HIV

2010 – 43
24 (55.8%) - IDU

2011 m. – 66
32 (48.5%) - IDU
Total number of ART: 226

2012 m. – 94
52 (55.3%) - IDU
Total number of ART: 291

For 1 new ART patient there are – 2 - 3 newly diagnosed infections

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt
Today, in order to pay for the treatment of one HIV positive person for the period of one year in Lithuania two persons have to work all year round without falling ill.

The treatment of 1 HIV patient in 20 years will cost the State Budget about 1 million litas.
ART in Baltic Countries (end of 2008)

ART cost for one citizen in Lithuania is 23 times smaller than in Estonia and 4 times smaller than in Latvia.

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt
Causes of HIV spread:

- HIV is spreading due to a particular human behavior that can be changed
- A person with HIV can transmit the infection to other person, without even knowing about his/her disease
- Positive Prevention:
  - HIV-infected IDUs
  - Sexually active HIV positive persons

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HIV transmission risk

• HIV is not a highly contagious pathogen
  – HIV transmission occurs when 0.001 ml. of HIV-infected human blood gets directly into the bloodstream through the mucous membranes or the injured skin

Source: HIV Medicine 2006

• Risk of transmission of VHC 10 times higher
• Risk of transmission of VHB 100 times higher

Source: HIV Medicine 2006
# Prevalence of Infection Markers among IDUs in the Baltic States, 2008

<table>
<thead>
<tr>
<th>Serological Marker (%)</th>
<th>Tallinn</th>
<th>Riga</th>
<th>Vilnius</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV Prevalence</td>
<td>55,3</td>
<td>22,6</td>
<td>8</td>
</tr>
<tr>
<td>HCV Prevalence</td>
<td>93,4</td>
<td>74,2</td>
<td>94,8</td>
</tr>
<tr>
<td>HBV Prevalence antiHBVcor</td>
<td>76,8</td>
<td>55,7</td>
<td>82</td>
</tr>
<tr>
<td>Coinfection HIV+HBV+HCV</td>
<td>47,4</td>
<td>15,6</td>
<td>6,8</td>
</tr>
</tbody>
</table>

8% had tuberculosis (Vilnius patient data)

Source: Irma Caplinskienė, RDS study 2008, supported by EU
### Vilnius injecting drug use characteristics

<table>
<thead>
<tr>
<th>Duration of injection career (years)</th>
<th>N</th>
<th>%</th>
<th>HCV+ (n/%)</th>
<th>Crude OR 95% CI</th>
<th>Fisher exact test p-value</th>
<th>Adjusted OR 95% CI**</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=2</td>
<td>14</td>
<td>4</td>
<td>12 85.7</td>
<td>1</td>
<td>0.0901</td>
<td>1</td>
</tr>
<tr>
<td>3-5</td>
<td>47</td>
<td>12</td>
<td>43 91.5</td>
<td>1.8 (0.1-14.2)</td>
<td>2.0 (0.3-12.3)</td>
<td></td>
</tr>
<tr>
<td>&gt;5</td>
<td>339</td>
<td>85</td>
<td>324 95.6</td>
<td>3.6 (0.4-18.5)</td>
<td>3.4 (0.7-16.7)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Irma Caplinskienė, RDS study 2008, supported by EU

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## Seropositive donations in Blood Centers in Baltic States 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV ½</th>
<th>HBV</th>
<th>HCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuania</td>
<td>1 : 5 252</td>
<td>1 : 609</td>
<td>1 : 191</td>
</tr>
<tr>
<td>Latvia</td>
<td>1 : 3 619</td>
<td>1 : 732</td>
<td>1 : 244</td>
</tr>
<tr>
<td>Estonia</td>
<td>1 : 19 791</td>
<td>1 : 5 398</td>
<td>1 : 1 413</td>
</tr>
</tbody>
</table>


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23rd Standardisation of Genomic Amplification Techniques (SoGAT) Group seminar

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Is This the Whole Picture?

Acute Hepatitis C

Asymptomatic infection

How many people are infected with hepatitis B or C virus?

Chronic hepatitis C infection
# The prevalence of viral hepatitis

## VBH

**Worldwide:**
- 350 mln. of infected (about 6%)
- Infection becomes chronic
  - in 30% of children
  - in 5% of adults

**In Lithuania:**
- Prevalence rate is about 1-3%
- Up to 100 of acute cases diagnosed
- Estimated number of infected 30 000 - 90 000

## VCH

**Worldwide:**
- 200 mln. of infected (3%)
- About 3-4 mln. get infected each year
- 60-70% develop chronic infection

**In Lithuania:**
- Prevalence rate is about 3%
  - (according to anti-HCV)
- Up to 50 of acute cases diagnosed
- Estimated number of infected 100 000

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Outcome of HCV Infection

- Subclinical Course: ~75%
- Persistent Infection: 85-100%
- Chronic Hepatitis: 50-70%
- Acute Hepatitis: ~25%
- Fulm. Hepatitis: Very Rare
- Liver Cirrhosis: 12-25% after ~20 yrs
- Liver Cancer: 1-5%
HBV routes of transmission

- Perinatal transmission
- Sexual transmission
- Intravenous injection
- Nonparenteral drug abuse
- Nosocomial infection
- Household contacts
Interaction of HIV and STI:

Most common cause of transmission is unprotected sex

| Common in persons with risky behaviour | Sometimes are not even aware that they themselves or their sexual partners engage in risky behavior |

The infections can be avoided - preventive measures are the same

STI incidence trends - a convenient indicator of sexual behavior

Sexually transmitted infection | The incubation period
--- | ---
Gonorrhea | 2 - 7 days.
Genital herpes infection | 2 - 7 days.
Chlamydia | 7 - 14 days.
Syphilis | 10 - 90 days.
Hepatitis B | 40 - 160 days.
HIV infection | 3 - 24 weeks.

Secondary prevention of STIs is a primary prevention of HIV

Source: WHO

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**Interaction of HIV and STI:**

<table>
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<th>Most common cause of transmission is unprotected sex</th>
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<tr>
<td>Sometimes are not even aware that they themselves or their sexual partners engage in risky behavior</td>
</tr>
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The infections can be avoided - preventive measures are the same

**STI incidence trends - a convenient indicator of sexual behavior**

**Patients with STIs are more likely to become infected with HIV**

- In case of genital inflammation can form microscopic wounds, ulcers, through which the body gets easily infected with HIV
- In blood, as well as in the genitalia, a number of white blood cells needed for virus to multiply increases

**HIV infection in turn has an impact on other STIs**

The treatment of persons with HIV and other STI’s is much more difficult

If a patient visits a doctor, he/she can be treated from sexually transmitted infections and given a help in behaviour change

- To avoid contracting HIV in the future, and for HIV-infected, to avoid transmitting the infection to others
- Early diagnosis and treatment of STIs slows down the spread of HIV

**Secondary prevention of STIs is a primary prevention of HIV**

Source: WHO

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Acute HIV infection and STI co-infection increases the likelihood of HIV transmission

200 times greater likelihood of HIV transmission if sex occurs during the first three months

1 in 5 intercourses with a newly infected HIV person ends up in HIV infection

Source: Cohen and Pilcher, JID, 2005

Source: STI 2001

Source: Q J Med 2001

Source: Cohen and Pilcher, JID, 2005
The risk when having an unprotected anal intercourse - from 0.8 to 3%
- The risk of transmission through man to woman anal intercourse 20 times higher than through vaginal intercourse
- It is estimated that up to 8% gays contracted HIV during oral sex in England and the United States
Condom use among infected with STI in Lithuania, 2011 (%)

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>HIV</th>
<th>Syphilis</th>
<th>Gonorrhea</th>
<th>Chlamydia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condom use:</td>
<td>Always</td>
<td>Often</td>
<td>From time to time</td>
<td>Rarely</td>
</tr>
</tbody>
</table>

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt

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Trends in STI incidence in Lithuania, 1996-2012
(cases per 100,000 population)

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt

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HIV and STI incidence in Lithuania, 2007-2012 (cases per 100,000 population)

In which European country the highest incidence of syphilis was reported in 2010?

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt

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The incidence of syphilis in Europe in 2010

- **In 2010**, incidence rate in Lithuania (10.3 cases per 100 thousand pop.) was more than twice as high as the EU average (4.4 cases per 100 thousand pop.).

- **In 2011**, incidence rate in Lithuania - 8.5 cases per 100 thousand pop. (EU average - 4.9 cases per 100 thousand pop.).

- **In 2012**, incidence rate in Lithuania - 7.6 cases per 100 thousand pop.
Incidence of gonorrhea in Europe in 2010

Source: ECDC
The number of reported cases of gonorrhea over 2009-2012 compared to laboratory study data in Lithuania

<table>
<thead>
<tr>
<th>Year</th>
<th>Reported cases</th>
<th>Nr. of tests</th>
<th>Laboratory-confirmed cases *</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>391</td>
<td>198 331</td>
<td>519</td>
</tr>
<tr>
<td>2010</td>
<td>315</td>
<td>179 300</td>
<td>543</td>
</tr>
<tr>
<td>2011</td>
<td>248</td>
<td>187 715</td>
<td>327</td>
</tr>
<tr>
<td>2012</td>
<td>219</td>
<td>197 715</td>
<td>326</td>
</tr>
</tbody>
</table>

* microscopically diagnosed cases of gonorrhea in men are included

Source: Centre for Communicable Diseases and AIDS, 2013, www.ulac.lt

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The examples of globally reemerging and new infectious diseases

The examples of globally reemerging and new infectious diseases

**Reemerging diseases** - ones that begin to spread again after a certain period of reduction in morbidity.

**New disease** - one that first appeared in the population, or which existed in the past, but saw an unusually rapid increase in incidence and its geographic distribution.

The risk of contracting TB

- HIV infection
  - primary infection
  - primary TB
  - Reinf. (exogen.)
  - A relative risk of contracting TB:
    - HIV-neg. = 10% during lifetime
    - HIV-pos. = 10% per year
  - Reactivation (endogen.)
  - Latent TB
  - Secondary TB
  - Progression of primary TB

HIV presents the partner in death-TB

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SITUATION WORLDWIDE

• One person can transmit an infection to 25-30 people,
• Every YEAR, 8 million people contract an infection,
• Every 20 seconds one person dies,
• About 1.7 million people die every year,
• It is estimated that one third of the world's population - is infected.
REALITY - to identify and treat as many as possible people with TB

To identify at least 70% cases of TM + contagious TB

To treat no less than 85% of cases of contagious TB

MDR-TB incidence rate in some countries (territories) in 2008

<table>
<thead>
<tr>
<th>No.</th>
<th>Country (territory)</th>
<th>MDR-TB incidence rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Azerbaijan (Baku)</td>
<td>22.3%</td>
</tr>
<tr>
<td>2.</td>
<td>Moldova</td>
<td>19.4%</td>
</tr>
<tr>
<td>3.</td>
<td>Ukraine (Donetsk)</td>
<td>16%</td>
</tr>
<tr>
<td>4.</td>
<td>Russia (Tomsk)</td>
<td>15%</td>
</tr>
<tr>
<td>5.</td>
<td>Uzbekistan (Tashkent)</td>
<td>14.8%</td>
</tr>
<tr>
<td>6.</td>
<td>Estonia</td>
<td>13.3%</td>
</tr>
<tr>
<td>7.</td>
<td>Russia (Mary El)</td>
<td>12.5%</td>
</tr>
<tr>
<td>8.</td>
<td>Latvia</td>
<td>10.8%</td>
</tr>
<tr>
<td>9.</td>
<td>Lithuania</td>
<td>9.8%</td>
</tr>
<tr>
<td>10.</td>
<td>Armenia</td>
<td>9.4%</td>
</tr>
</tbody>
</table>

What are the dangers of MDR-TB?
- Treatment is protracted from 6 month to 2-5 years;
- Treatment costs increase tens/hundreds times;
- Poor treatment results;
- **XDR TB** (extensively drug resistant TB) occurs and TB treatment becomes complicated, practically incurable;
- Requires huge resources (financial, material, human), which may be avoided otherwise.
- Poor treatment outcome.

The medical care of an IDU patient with TB and HIV co-infection requires a lot of effort due to a number of factors:

- Anti-TB and ART interactions with illegal drugs;
- Increased likelihood of hepatotoxicity in IDUs receiving OST;
- Rifampicin reduces methadon load in plasma (33–68 %), therefore the symptoms of withdrawal can occur;
- Infection with VHB and/or VHC;
- Failure to comply with treatment regiments.
The importance of adherence to HIV treatment regimen

- To make HIV treatment a success at least 95% adherence with therapy is required.
- One missed dose per week amounts to 93% adherence.
- In case of two daily dose treatment regimen, it means that you can forget to take no more than 2-3 doses per month.
- <80% adherence to treatment prescriptions is almost always ineffective.
- 'Good' adherence to treatment prescriptions, when "a majority" of doses are not missed will be unsuccessful.
- Only rarely missed dosing is tolerable – adherence means strict adherence.

The Emerging Role of the Drug related CD Casemanagement

1. People with complex problems need interdisciplinary support.
2. Passive information on what a patient has to do and how is not effective.

A need for informed consent to engage the patient into decision taking process about own health and further actions (since we talk about his behaviour change and medication use, for the entire life in case of HIV).

Psychological and Social support

Infection Prevention and Adherence Counseling

Infectologist, Pharmacologist and Addiction Specialist, etc...
Drug related CD Case Management Approach

Manangement
Management is the process of getting work done through others - done properly, on time, and within budget

Source:

- When a person is incapable to take responsibility for own behaviour harmful for himself, his environment and population
- Somebody has to take some responsibility for this individual behaviour and take action for some time
- Rights and responsibilities
What is harm reduction?

“Harm reduction can be viewed as the prevention of adverse consequences of illicit drug use without necessarily reducing their consumption.”

Source: Costigan, Crofts & Reid, 2003, p. 35

Comprehensive approach versus HR approach
Primary prevention – to prevent disease (don’t start using drugs, prevent infections).

Secondary prevention – rapid diagnosis and cure (abstain from drug use, cure infectious disease).

Tertiary prevention – to prevent complications (reduce drug-related harm, prevent OI)
Drug Policy and the HIV Movement

• HIV Movement lobbies quickly and develops activities of harm reduction – pragmatic approach
• Long term goals – to have less peoples dependent on drugs – others have to develop
• Otherwise, it will be disbalanced

What is future?

• Society may not be able to cope with much beyond 2% to 3% of its population addicted to hard drugs.
• Containment may not be enough.

Neil McKeganey
Professor of Drug Misuse Research
University of Glasgow
## Causes for infectious diseases and their reappearance

<table>
<thead>
<tr>
<th>Cause</th>
<th>Explanation</th>
<th>Example and related disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>The emergence of new technologies</td>
<td>Changes in food production, marketing, and air ventilation systems</td>
<td>Bovine spongiform encephalopathy, Legionnaires' disease</td>
</tr>
<tr>
<td>Intrusion into wildlife areas, changes in ecosystems and the use land resources</td>
<td>New farm land, mineral resource mining and afforestation areas</td>
<td>Ebola fever, drop fever, hantavirus</td>
</tr>
<tr>
<td>International travel and international trade</td>
<td>Increased flows of travelers and goods transported by air</td>
<td>Severe acute respiratory syndrome, cholera, meningitis, the virus</td>
</tr>
<tr>
<td>Climate change</td>
<td>Increase of some disease-carrying organisms in ecosystems</td>
<td>Malaria, dengue fever, yellow fever</td>
</tr>
<tr>
<td>Weakening of PH infrastructure, failure to apply sanitary measures</td>
<td>The confusion of natural and healthy lifestyles - the increase of ungrounded scientific info; monetary policy, weakening health systems in the 90s, the decrease of shelters, providing vaccination in sub-Saharan Africa</td>
<td>Diphtheria (outbreaks in Russia ...), pertussis, cholera, hepatitis, malaria</td>
</tr>
<tr>
<td>Wars, terrorism, mass migration</td>
<td>Environmental pollution, and destruction of infrastructure</td>
<td>Cholera, anthrax, leishmaniasis</td>
</tr>
<tr>
<td>Changes in demography and behaviour</td>
<td>Concentration of the population in urban areas, sexual practices, drug use</td>
<td>AIDS, syphilis, Hepatitis B and C</td>
</tr>
<tr>
<td>Weakening of immune system</td>
<td>Excessive use of antibiotics</td>
<td>Multidrug-resistant tuberculosis</td>
</tr>
<tr>
<td>Microbial resistance</td>
<td>Antibiotic and insecticide resistance</td>
<td>Tuberculosis, AIDS, gonorrhea</td>
</tr>
</tbody>
</table>

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No matter how you look at it, the future in terms of infectious diseases looks ominous!

Šaltinis: Department of Health, Kimball, 2000 m., Morse, 1995; Pasaulio sveikatos organizacija, 1999 m.

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Team work

It is important to have similar sheet music and sing one song – in one or several voices

Thank you for your attention!

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