HIV outbreak in Greece: Results of the ARISTOTLE study

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A Seek-Test-Treat-Retain (STTR) intervention to decrease HIV/AIDS transmission among IDUs in Athens metropolitan area: “Aristotle” Programme

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- **Advisory Board:** S. Friedman, L. Wiessing, M. Van de Laar, K. Gazgalidis, M. Donoghoe, D. Des Jarlais, D. Heckathorn

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2. Hellenic Center for Disease Control and Prevention (HCDCP)
3. Organization Against Drugs (OKANA)
4. National Development and Research Institutes, Inc., New York, USA
5. European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)
6. European Center for Disease Prevention & Control (ECDC)
7. WHO-Europe
8. Beth Israel Medical Centre, New York, USA
9. Cornell University

University of Athens
Organisation Against Drugs

[NSRF 2007-2013]
Introduction - Aims of the programme
Newly diagnosed cases of HIV-1 infections reported in Greece, 2000-2012

Surveillance data from the Hellenic Centre for Diseases Control and Prevention
Aristotle Programme

Aims of the programme:
- To screen for anti-HIV IDUs in Athens Metropolitan Area.
- To provide the WHO/UNODC/UNAIDS and ECDC/EMCDDA prevention, treatment and care package.
- To decrease the incidence of HIV-1 among IDUs.

Secondary aims include:
- To provide an estimate of HIV prevalence among IDUs during the course of the study.
- To describe phylogenetic networks
- To study behavioral characteristics of this population
- To increase linkage and retention to care of IDUs
Methods
Sampling method - Participants

**Sampling method:**
- Respondent Driven Sampling (RDS)

**Seeds:**
- Non-randomly selected IDUs (selected by the staff of OKANA on the basis of diversity concerning gender, age, ethnicity and HIV status)

**Eligibility criteria for participants.** Persons who:
- Have a valid coupon
- Have injected drugs in the past 12 months
- Live in the area of Athens
- ≥18 years old

**Recruitment in 5 rounds within 16-18 months (Aug 2012 – Dec 2013)**
- Currently in last round. In each round
  - 5-15 seeds
  - A sample of approximately 1,400 IDUs per round
  - Duration of each round: 10-12 weeks
What does participation to the program involve?  
Description of the process

- Participant arrives at interview site
- If valid coupon: Eligibility screening
- If eligible: Consent process
- If consent obtained: Interview & blood sample collection for HIV testing

At the end of the process:
- Payment of primary incentive
- 3 coupons are provided
- Syringes-leaflets are provided

 Approximately 3 days later:
- HIV test result
- Payment of secondary incentive(s) including payment for collecting HIV test result
- For HIV (+) participants: Referral to ARV treatment - Priority referral to OST
A person can participate in multiple rounds
BUT only once in each round
RDS site & staff - Incentives

- **Site:**
  A building of the Organisation Against Drugs located in the centre of Athens

- **Staff:**
  Ex-IDUs, social workers, psychologist, cultural mediators, one medical doctor - one volunteer from an NGO

- **Incentives:**
  - 5 € for questionnaires and blood sampling
  - 3 € for each IDU they recruit (up to 3 recruits)
  - In the 2\textsuperscript{nd} round and onwards, an additional amount of 3 € is given to participants when they collect their HIV test result
The questionnaire of the National HIV Behavioral Surveillance System (NHBS)-IDU3 was used as the basis for the core questionnaire of ARISTOTLE (modified as appropriate in order to be used in IDUs in Greece)

- It includes sections on:
  - Network size
  - Sexual behavior
  - Drug use
  - Alcohol use
  - Alcohol and drug treatment
  - HIV testing experience
  - Health condition
  - Assessment of prevention activities
  - Knowledge/Attitude on Recent HIV Infection (Round 2)
  - Food insecurity (Round 2)
Blood sampling – Laboratory testing

- After the interview, blood sample is collected (10 ml)
  - Collected blood samples are transported on a daily basis to the National Retrovirus Reference Centre for testing (4.00 pm).
  - HIV tests are performed with a microparticle EIA anti-HIV-1/2 (AxSYM HIV-1/2 gO, Abbott)
  - HIV-1 and HIV-2 confirmation by Western Blot (MP Diagnostics)
  - Molecular HIV-1 typing conducted with deep-sequencing and phylogenetic analysis will be used in order to identify transmission networks.
  - LAg-Avidity EIA for anti-HIV1/2 positive samples
Referrals and counseling of HIV(+) participants

- One psychologist and 2 social workers work on referrals (OST, ART) and counseling

- NGO “Positive Voice” collaborates with ARISTOTLE – A volunteer is located in the same building to assist the counseling of seropositive IDUs

- Seropositive migrants without documents are referred to NGO Praxis
Results
## Progress of ARISTOTLE

<table>
<thead>
<tr>
<th>Round</th>
<th>Time period</th>
<th>Participants (&amp; seeds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Aug2012 - Oct2012</td>
<td>1.415</td>
</tr>
<tr>
<td>B</td>
<td>Dec2012 - Mar2013</td>
<td>1.444</td>
</tr>
<tr>
<td>C</td>
<td>Mar2013 - Jun2013</td>
<td>1.434</td>
</tr>
<tr>
<td>D</td>
<td>Jun2013 - Sep2012</td>
<td>1.413</td>
</tr>
<tr>
<td>E</td>
<td>Sep2013 - in progress</td>
<td>in progress</td>
</tr>
</tbody>
</table>
Chains of RDS by anti-HIV status (results from round A)

- Anti-HIV (-)
- Anti-HIV (+)
Coverage of IDU population in Athens

Map of Athens marked with the areas where IDUs reported that they live in (green circles) –

The blue symbol indicates the location of the Aristotle site (from round A)
Total number of participants
(20/8/2012-11/9/2013)

- In the first 4 rounds:
  - 5,700 questionnaires and blood samples approx.
  - 3,007 unique persons participated to the programme

1517 IDUs participated in multiple rounds
Estimated number of problem drug users who injected drugs in the last month

- **Greek Reitox Focal Point (estimate for 2011)**
  - IDU in the last month → **2,800** (2,330-3,630)

- **Aristotle:**
  - IDU in the last 12 months → **3,007 persons**
  - IDU in the last month → **2,430 persons**

- In 2012, Aristotle participated to the capture-recapture carried out by the Greek Reitox Focal Point
  - Out of **1,515** reported by Aristotle → only **442** were also present in other sources participating to the capture-recapture (KETHEA, 18 ANO, EKTEPN)
HIV prevalence (by EIA) per round & weighted estimate for RDS

In total, out of 3,007 participants in the 4 rounds: → 523 (17.4%) were found anti-HIV(+)
HIV prevalence according to country of origin (rounds A-D)

- Greece: 16.6%
- Afghanistan/Iran: 29.3%
- Middle East (other): 18.7%
- Eastern Europe: 23.2%
- Asia (other): 25.4%
- Africa: 13.5%
- Other: 17.2%
Demographic characteristics of the participants (excl. seeds)

<table>
<thead>
<tr>
<th></th>
<th>Round A (N=1404)</th>
<th>Round B (N=1438)</th>
<th>Round C (N=1429)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>35.3 (7.9)</td>
<td>36.1 (8.3)</td>
<td>36.4 (8.1)</td>
</tr>
</tbody>
</table>

- **Male**: Country of origin: Greece
- **Homeless**: Without health insurance

Bar chart showing the distribution of characteristics across rounds A, B, and C.
Injecting drug use

Which drug do you inject most often?

- A: Heroin/Thai
- B: Cocaine
- C: Other

Bar chart showing the percentage of injecting drug use for each category.
# Injecting drug use

<table>
<thead>
<tr>
<th>Duration of injecting drug use</th>
<th>Round A (N=1404)</th>
<th>Round B (N=1438)</th>
<th>Round C (N=1429)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median (25th, 75th)</strong></td>
<td>12 (7, 18)</td>
<td>13 (7, 19)</td>
<td>13 (7, 19)</td>
</tr>
</tbody>
</table>

| Injecting drug use at least once per day in the past 12 months, % | 54.0% | 29.3% | 25.5% |
| If more than once per day, how many times per day on an average day, median (25th, 75th), | 3 (2, 4) | 3 (2, 4) | 3 (2, 4) |

| Sharing syringes in the past 12 months “about half of times or more”, % | 11.1% | 5.2% | 4.7% |

| Shared syringes (the last time they injected), % | 19.5% | 18.2% | 16.5% |
# Use of sisha/methamphetamines

<table>
<thead>
<tr>
<th>Injecting sisha/methamphetamines in the past 12 months, %</th>
<th>Round A (N=1404)</th>
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<th>Round C (N=1429)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least once per day</td>
<td>0.9%</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Not daily but approx. once per week</td>
<td>1.1%</td>
<td>0.4%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Less than once per week/occasionally</td>
<td>6.9%</td>
<td>4.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Never</td>
<td>91.1%</td>
<td>95.0%</td>
<td>95.1%</td>
</tr>
</tbody>
</table>
Sexual behavior
(past 12 months)

<table>
<thead>
<tr>
<th>Use of condom “Always” or “Usually yes”, %</th>
<th>Round A</th>
<th>Round B</th>
<th>Round C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>58.7%</td>
<td>58.7%</td>
<td>60.2%</td>
</tr>
<tr>
<td>Females</td>
<td>36.1%</td>
<td>43.8%</td>
<td>39.9%</td>
</tr>
</tbody>
</table>

Received money or drugs in exchange for sex, %

Last sexual partner non-IDU, %
## Access to treatment and prevention programmes (1)

<table>
<thead>
<tr>
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<th>Round B (N=1438)</th>
<th>Round C (N=1429)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received free syringes through prevention activities (past 12 months), %</td>
<td>61.7%</td>
<td>54.3%</td>
<td>56.3%</td>
</tr>
<tr>
<td>If yes, how many syringes in the last month, median (25th, 75th)</td>
<td>20 (10, 45)</td>
<td>20 (10, 40)</td>
<td>20 (10, 40)</td>
</tr>
<tr>
<td>One-on-one conversation with an outreach worker, counsellor, or prevention program worker about ways to prevent HIV (past 12 months), %</td>
<td>27.2%</td>
<td>28.2%</td>
<td>34.2%</td>
</tr>
</tbody>
</table>
Access to treatment and prevention programmes (2)

Participation to:

- Drug treatment programme: 67.5%, 67.6%, 71.6%
- OST (ever): 23.7%, 29.7%, 33.5%
- OST (now): 10.4%, 15.5%, 20.2%
# Previous testing and treatment for HIV

<table>
<thead>
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<th>Round B (N=1438)</th>
<th>Round C (N=1429)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever tested for HIV, %</td>
<td>64.1%</td>
<td>80.7%</td>
<td>87.3%</td>
</tr>
<tr>
<td>Aware of an anti-HIV(+) result, %</td>
<td>4.1%</td>
<td>8.9%</td>
<td>11.4%</td>
</tr>
<tr>
<td>Out of those aware of seropositivity, % under ART at the time they participated to the programme</td>
<td>22.4%</td>
<td>26.6%</td>
<td>35.0%</td>
</tr>
</tbody>
</table>
Factors associated with increased risk of HIV infection

- From round A, the following variables were independently associated with increased risk of HIV infection:
  - Homelessness
    (OR vs. not being homeless: 2.3, p<0.001)
  - Cocaine as main substance of use
    (OR vs. heroin: 2.6, p<0.001)
  - Injecting drug use at least daily (past 12 months)
    (OR vs. <1 per day: 2.1, p<0.001)
  - Sharing syringes ("almost always", "always")
    (OR vs. never in the past year: 2.2, p=0.041)

*Sypsa et al, Am J Public Health (in press)*
Linkage to ARV treatment

- Out of 411 IDUs who were found to be seropositive within the first 3 rounds of the programmes:
  - **219 (53%)** were diagnosed **for the first time** through Aristotle
  - The remaining **192 (47%)** had been diagnosed in the past
    - 92 had been linked to an infectious disease unit in the past—100 not linked

Out of 319 persons (unlinked) ➔ **118 (37%)** were linked after their participation to Aristotle
Syringes distributed to the participants of the programme (Aug 2012- Aug 2013)

In total, 69,530 syringes were distributed.
Evaluation of the programme by the participants (data from round D)

**Level of satisfaction:**
- **Overall**
- **Counselling**
- **Information about HIV test result**
- **Blood sampling**
- **Interview**

The chart illustrates the level of satisfaction for each component of the programme, ranging from **No** to **Very high**, with the majority indicating a **Very high** level of satisfaction.
Main points to discuss (1)

- The recruitment of a large number of IDUs from a wide geographic area in Athens in a short period of time - Acceptability of the programme by the target population of IDUS

- 523 IDUs were found to be anti-HIV(+). Approximately half of them were diagnosed for the first time through Aristotle

- 37% of the new diagnoses (or old ones who were not linked) were linked to infectious disease units after their participation to Aristotle

- Approximately 55% of men and 30% of women IDUs reported last sexual partner who was non-IDU → potential of substantial HIV-1 spread in the non-injecting population in the near future (as in the example of New-York, DesJarlais et al, 2011).
Until now, a large number of HIV infected IDUs has been identified – Linkage and retention to care (ARV, OST) is a challenge due to particular characteristic of seropositive IDUs (lack of health insurance, homelessness, coinfection with hepatitis C, food insecurity).

Homelessness:
- **For seropositive IDUs**: It makes linkage and retention to care even more challenging.
- **For IDUs who are not infected**: It is associated with increased risk of HIV infection.
- **Overall**: the efficacy of needle and syringe programmes depends also on housing as it may be difficult for homeless IDUs to store sufficient quantities of clean syringes.
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