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HIV rapid test in a community setting as a strategy to improve access to HIV testing: data from a multicentre experience in Italy

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SUMMARY

4,000 new HIV diagnoses and approximately 800 AIDS cases are still reported annually in Italy. Improving public awareness and bringing out HIV-undiagnosed individuals are keystones to progress towards the control of the HIV epidemic. For this purpose, the Open HIV TEST project was organized and delivered by the Italian NGO Anlaids, together with local infectious diseases specialists, in order to provide free access to HIV testing outside the healthcare setting. Between October 2017 and February 2019 six Open HIV TEST initiatives were delivered in six Italian cities (3 northern cities, 1 central and 2 southern cities). In all, 581 people were tested: the overall prevalence of HIV test reactivity was 0.7%. Participants were also asked about previous screenings and about their satisfaction with the initiative: previous HIV screening due to pregnancy or surgical procedures was reported mainly by participants in northern centres ($p<0.001$); finally, the initiative was considered useful and noteworthy by 99% of participants. Prevalence of HIV test reactivity in our experience was in line with national data. Our experience suggests that active testing and counselling strategies in community settings should be recommended and institutionalized by local health authorities in line with the 90-90-90 global strategy.

Keywords: health promotion, HIV infection, prevention intervention, HIV rapid test.

INTRODUCTION

The HIV epidemic continues to affect European countries [1]. Although the effectiveness of the therapy has improved the survival of HIV-infected people and decreased the number of AIDS-related deaths, transforming HIV infection into a chronic life-long disease, HIV-positive people who are not diagnosed or engaged in care cannot take advantage of the benefits of treatment [2-4]. It was estimated that in 2016, around the 16% of all people living with HIV (PLWHIV) remained undiagnosed in 11 European Union (EU) countries: a significant rate of people is at risk of both individual damage in terms of AIDS progression to death and also harming the collectivity by determining the ongoing transmission of the infection [5-7]. Despite the success in increasing the average of life expectancy and improving living conditions of PLWHIV, there is a steady trend in the last decade with new HIV diagnosis. Italian data highlight that the proportion of undiagnosed patients is lower than European reports, ranging

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from 10% to 13%, with the percentage of undiagnosed cases particularly high among aged below 25 years old (25-28%) whereas the lowest percentage was among those aged 50-59 years old [8, 9].
In particular, at the end of 2017, a total of 130,000 (115,000-145,000) individuals aged 15 years or more were estimated to living with HIV in Italy, with a prevalence of 0.28 (0.24-0.32) per 100,000 residents, of whom 87.6% currently on treatment with highly active antiretroviral therapy (HAART) [10]. The distribution of new AIDS cases by transmission mode has changed over time, with a decreasing proportion of people who inject drug (31.2% in 2005 and versus 11.3% in 2016) and an increasing proportion of cases acquired through sexual intercourse (61.3% in 2005 compared to 79.8% in 2016) [10]. All this said, knowing the number and features of PLWHIV becomes essential to address the requirements of the national health system (NHS) and to reduce a burden of illness hardly attainable and difficult to retain in care still present in Italy [6-8].
HIV rapid test, thanks to the technical simplicity and the rapid results, useful especially in extra-hospital settings, could be helpful in screening and increases the awareness of HIV infection becoming an important tool for sexual transmitted diseases awareness [11, 12].
HIV rapid test procedure involves both the person to be tested which collects his or her own specimen (oral fluid) and an appropriately trained health staff able to proficiently interpret results and give counseling according with the WHO recommendation [13, 14].
HIV rapid test is useful, easy-to-use devices to scale-up HIV testing in a large number of contexts. The WHO promotes initiative for HIV testing also outside clinical settings especially addressed to targets that need it the most. Hence, community-testing initiatives may provide services that would encourage testing also in marginalized population groups [15, 16].
This study aimed at assessing the available evidence for feasibility, acceptability and effectiveness of carrying out HIV testing in community settings in resource-rich countries and to consider how the community testing strategies may be successfully implemented.
We conducted a national project promoted by ANLAIDS about the HIV rapid test, offered outside the formal health facilities in collaboration with local infectious diseases specialists, in order to assess the feasibility and potential yields of HIV self-testing implementation in different settings. This article reports the main findings of this project.

MATERIALS AND METHODS

Between October 18th, 2017 and February 19th, 2019, 6 "Open HIV TEST" initiatives have been organized and delivered by the Italian NGO ANLAIDS together with local infectious diseases specialists. A total of six cities from five different Regions distributed among Northern (Casale Monferrato, Cuneo, Desio), Central (Viareggio) and Southern Italy (Napoli and Bari) were involved from October 2017 to February 2019.
In each city, the same testing procedures were undertaken. The days before the Open HIV TEST initiative a wide communication strategy, involving the local media, spread information regarding the initiative, inviting the whole community to join.
A precise site in the city for the mobile unit was identified together with local authorities according to the following criteria:
- attended by young people;
- recognized as a central avenue;
- easily to get also from the suburban population;
- close to the train station;
- closed off.

Starting from the 8:00 p.m. of each day, three medical doctors, one psychologist and three voluntaries were available for HIV counseling and testing. Eligible criteria for HIV testing were being older than 18 years, in agreement with the Italian regulation for the testing consent, and the ability to provide informed consent.
The Medical staff from the local infectious disease clinic was in charge of the HIV pre-test counseling that included basic information on HIV/AIDS and a detailed explanation of testing procedures. The respect for testing privacy and confidentiality of all procedures was guaranteed by the infectious diseases specialists and by performing all testing procedure in a close unit and testing users one by one. A medical doctor communicated the test results together with a proper post-test counseling, ensuring the referral of all the reactive tests to the infectious diseases clinic for test confirmation and initiation of care. An HIV rapid test performed on oral fluid (OraQuick Advance® Rapid HIV-

1/2 Antibody Test; OraSure Technologies Inc.,) was used. While waiting for the test results, an anonymous questionnaire was administered. Socio-demographic data and attitudes towards the initiatives were collected. Descriptive and comparative analysis, by cities and geographic macro area, were performed using STATA software (version 13.0). All categorical variables were reported as absolute and relative frequencies (percentages) and Chi-square test (with the Fisher's correction when appropriate) was performed.

Ethics approval

The study did not require a formal approval from the ethics committee according to the Italian law since it was performed as an observational retrospective analysis in the context of normal clinical routines. The study was conducted in accordance with the Declaration of Helsinki and national and institutional standards. All patients provided informed written consent for the anonymous collection and use of their data for research purposes.

RESULTS

Overall, 581 people (58% males) were tested: 299 (51%) in cities of North, 58 (10%) of Centre, 224 (38%) in cities of the south of Italy.

The socio-demographic information and attitudes towards the initiative of people tested, overall and stratified by geographic macro area of the cities hosting the initiative are shown in Table 1.

People tested were mainly Italians (96%, n=558), without differences among geographic areas. The most represented age group was 18-25 years (58%, n=334), followed by 26-30 years group (20%, n=119), 31-40 years group (12%, n=69), 41-50 years group (7%, n=39) and over 50 (3%, n=17). The age group 18-25 was the most represented in the northern (69%, n=205) and southern (51%, n=113) areas, while in the centre the majority were in the 26-30 (40%, n=23) and 31-40 (17%, n=10) age group ($p<0.001$). A low level of education (≤8 years) was reported by the 12% (n=68) of people tested, while the majority (88%, n=513) had a high education level (>8 years), with no differences among geographic areas.

In northern and southern cities, the majority of participants were students, respectively the 44% and 47%, compared with 26% in central Italy ($p<0.001$).

The majority of subjects from all the cities denied a previous HIV test (73%, n=422). Among those who referred previous testing (26%, n=151), 57% (n=86) did not report the reason for testing, while, when referred, the principal reason was unprotected sexual intercourses (24%, n=37), followed by surgical intervention (8%, n.12) and pregnancy (7%, n. 10). Notably, an HIV screening due to pregnancy or surgical procedures was reported mainly by participants in northern centers ($p<0.001$). Lastly, the initiative was considered useful and remarkable by 99% of people participating.

The pooled prevalence of HIV tests' reactivity was of 0.7% (4/581). All the 4 positive tests were documented in the same city in Central Italy and were confirmed as positive by the Infectious Disease centre where they were referred.

DISCUSSION

HIV infection remains one of the major public health issues in the EU [17]. It is of concern that 50% of the new HIV cases are diagnosed as late presenters or with advanced infection, reflecting the lack of access to HIV testing and counseling, not only in low-income countries but also in rich ones [18-20].

Delayed initiation of life-saving HIV treatment decreases both the clinical benefits and the preventive value of the treatment in inhibiting further HIV transmission, hence further efforts should be implemented to improve access to HIV testing and treatment [21, 22]. In our data, all reactive tests were from the same city from Central Italy, where the prevalence reached 7%. It should be considered that the population enrolled in this location has different characteristics comparing with the other cities: in particular mean age was higher and percentage of student was lower. In addition, the testing place in the Central Italian city was attended by many males who have sex with males, confirming this specific behavior at particular risk of infection [23].

Accordingly, HIV self-testing strategies could represent a valid help in reducing the burden of HIV infected subjects still undiagnosed: since this population disproportionately contribute to the transmission of the HIV infection, reducing the size of undiagnosed PLWHIV is a pivotal challenge in terms of control of the epidemic [24-26].

The development of HIV rapid testing technolo-

Table 1 - Prevalence of HIV test's reactivity, socio-demographic information and attitudes towards the initiative of people tested, overall and stratified by geographic macro area (north, centre, south of Italy) of the cities hosting the initiative.

	Overall n (%)	*North n (%)*	*Centre n (%)*	*South n (%)*	
People tested	581 (100)	299 (100)	58 (100)	224(100)	
Prevalence of HIV test's reactivity	4 (0.7)	0 (0)	4 (6.8)	0 (0)	
Socio-demographic information					
Sex					
Female	245 (42)	137 (46)	24 (42)	84 (37)	
Male	335 (58)	162 (54)	34 (59)	139 (63)	0.294
Other	1 (0.2)	0 (0.0)	0 (0.0)	1 (0.4)	
Age group					
18-25	334 (58)	205 (69)	16 (27)	113 (51)	
26-30	119 (20)	36 (12)	23 (40)	60 (27)	
31-40	69 (12)	32 (11)	10 (17)	27 (12)	0.00
41-50	39 (7)	20 (7)	5 (9)	14 (6)	
over 50	17 (3)	5 (2)	4 (7)	8 (4)	
Education (years)					
≤8	68 (12)	33 (11)	14 (24)	21 (9)	0.00
>8	513 (88)	266 (89)	44 (76)	203 (91)	
Nationality					
Italian	558 (96)	291 (98)	54 (93)	213 (96)	
European	6 (1)	2 (1)	1 (8)	3 (1)	0.3
Extra-European	14 (3)	4 (1)	3 (5)	7 (3)	
Occupation					
Student	251 (43)	131 (44)	15 (26)	105 (47)	
Employed	215 (37)	128 (43)	22 (10)	65 (29)	0.00
Unemployed	38(7)	19 (6)	7 (12)	12 (5)	
Other	74 (13)	20 (7)	14 (24)	40 (18)	
Attitudes towards the initiative					
Previous Test					
Yes	151 (26)	80 (27)	18 (31)	53 (24)	
No	422 (73)	217 (73)	40 (69.0)	165 (74)	0.3
No answer	5 (1)	1 (0)	0 (0)	4 (2)	
If yes, why					
Pregnancy	10 (7)	9 (11)	0 (0)	1 (1)	
Surgical intervention	12 (8)	9 (11)	0 (0)	3 (5)	0.00
Unprotected sexual intercourse	37 (24)	8 (10)	2 (11)	27 (51)	
Other	86 (57)	51 (64)	12 (89)	23 (43)	
Is the initiative useful?					
Yes	574 (98)	296 (99)	58 (100)	220 (99)	
No	3 (1)	0 (0)	0 (0)	3 (1)	0.1
No answer	3 (1)	3 (1)	0 (0)	0 (0)	
Level of satisfaction					
Very satisficed	291 (52)	139 (47)	23 (62)	129 (58)	0.01
Satisficed	265 (48)	159 (53)	14 (38)	92 (42)	
Would you suggest this initiative?					
Yes	555 (100)	297 (100)	39 (100)	219 (99)	
No	2 (0)	0 (0)	0 (0)	2 (2)	0.5
No answer	2 (0)	1 (0)	0 (0)	0 (0)	

gy has created new opportunities for promoting HIV testing interventions outside formal health facilities [27-29]. National test campaign like the one we performed has the primary purpose to increase the level of attention among individuals, more than find HIV infected people still undiagnosed: these interventions have been designed to target specific groups of the population who are most at risk of infection [30-33].

Moreover, HIV oral testing offers many advantages over the standard blood tests, especially in terms of acceptability and feasibility from the high-risk population who still get out of current HIV testing strategies. Since it can be performed independently, HIV oral testing could reduce logistic barriers such as the need of referring to hospital; furthermore, it provides other benefits: first of all, simplicity, allowing the execution of test from all subjects, but also its capacity of overcoming the scaring "waiting results" period, providing immediate result [13, 14, 34].

Community testing strategies may be successfully implemented with local partnership like infectious diseases specialists, politician, and other association that operate to raise awareness among the population on these items. This can help also to give a better and coordinated answer in facing the HIV issue.

In line with current knowledge, in this study HIV oral testing was highly appreciated from the population, thanks to the previous mentioned characteristics. Overall, the prevalence of positive tests was low, as expected. However, the access to the test was far from being diffuse among different populations; subjects older than 40 years account for less than 10%, and only the 12% of enrolled people reported a low education level: both are risk groups that should be screened. Moreover, the majority of patients denied a previous HIV test, while among those who already underwent an HIV test, the principal indication was risky sexual behavior. We used oral rapid tests of "third generation", able to look for antibodies only, and should be noticed that the "window period" of these tests is longer than 4th generation test. Capillary blood tests, that are more accurate, could be an evolution of these approach [35-37].

Results had shown that the youth population in particular willingly accepts the use of rapid testing outside the hospital setting: these initiatives may also represent an opportunity for health education about all sexually transmitted diseases and their preventive measures, together with helping facing the taboo of the HIV test is by assimilating it to other more common laboratory tests [38, 39]. On the other hand, the population at major risk (immigrants, promiscuous homosexuals, heterosexuals over 50), has probably not been reached by this initiative: in these cases, more specific intervention measures are needed, and multilevel approaches tailored on each category at risk must be redefined.

In addition to this, a better understanding of the demographic, socioeconomic and network factors, as well as the cultural, structural and political contexts that influence sexual health risks in our country, has to be reached to effectively develop, implement and evaluate targeted sexual health promotion and HIV prevention interventions.

The study has some limitations. Firstly, this is a short report and lack of important data like: sex orientation, use of condom, use of drugs that weren't collected. Also, the enrolled population could have been influenced by the start time of the activity (8pm), that could have selected mostly the younger audience. This aspect should be considered to explain some of our findings such us the high percentage of people never tested before, that could be related to the young age and not to a general low interest towards the HIV testing itself. Similarly, level of education and occupation are variables strongly influenced by the age.

The wide availability of HIV oral test will not end the HIV pandemic and the test itself presents some limitations, since it requires surveillance monitoring policies, especially addressing key issues of concern: the risk of misuse, the need of linkage to prevention, and eventual linkage to care. Indeed, the major impacts of HIV infection demand a strong response from researchers, professionals, policy-makers and affected communities to address the problem and seek solutions to improve, in particular, the sexual health of vulnerable populations in low income setting such as in high countries [40-42]. Our brief report has some limitations about lack of data on risk factors, and other important information that could help to understand better the community setting; in fact this is only a simple report, to share data about our experience that could promote other initiative in extra-hospital setting. In conclusions, our experience confirmed that HIV rapid testing

in a community setting could embody an effective strategy to reach the young population, difficult to test in healthcare settings. This "Open HIV TEST" initiative represented a way to spread awareness on the importance of HIV testing among the general population. Moreover, such testing and counseling strategies in community settings should be institutionalized from local health authorities also in Italy, in line with the 90-90-90 global strategy.

Conflicts of interest: none

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REFERENCES

[1] Tavoschi L., Gomes Dias J., Pharris A. EU/EEA-HIVSurveillance Network. New HIV diagnoses among adults aged 50 years or older in 31 European countries, 2004-15: an analysis of surveillance data. *Lancet HIV* 4, 11, 514-521, 2017.
[2] Camoni L., Regine V., Raimondo M., Salfa M.C., Boros S., Suligoi B. The continued ageing of people with AIDS in Italy: recent trend from the national AIDS Registry. *Ann. Ist. Super. Sanità* 50, 3, 291-297, 2014.
[3] Pharris A., Quinten C., Tavoschi L., Spiteri G., Amato-Gauci A.J., ECDCHIV/AIDS Surveillance Network. Trends in HIV surveillance data in the EU/EEA, 2005 to 2014: new HIV diagnoses still increasing in men who have sex with men. *Euro Surveill.* 20, 47, 2015.
[4] Jones A., Cremin I.., Abdullah F., et al. Transformation of HIV from pandemic to low-endemic levels: a public health approach to combination prevention. *Lancet* 3, 384, 272-279, 2014.
[5] Camoni L., Raimondo M., Dorrucci M., et al. Estimating minimum adult HIV prevalence: a cross-sectional study to assess the characteristics of people living with HIV in Italy. *AIDS Res. Hum. Retroviruses* 31, 3, 282-287, 2015.
[6] Mahy M., Autenrieth C.S., Stanecki K., Wynd S. Increasing trends in HIV prevalence among people aged 50 years and older: evidence from estimates and survey data. *AIDS* 28, 453-459, 2014.
[7] Uccella I., Petrelli A.,Vesci M.F., et al. HIV rapid testing in the framework of an STI prevention project on a cohort of vulnerable Italians and immigrants. *AIDS Care* 29, 996-1002, 2017.
[8] Mammone A., Pezzotti P., Regine V., et al. How many people are living with undiagnosed HIV infection? An estimate for Italy, based on surveillance data. *AIDS* 30, 7, 1131-1136, 2016.
[9] Mammone A., Pezzotti P., Angeletti C., et al. HIV incidence estimate combining HIV/AIDS surveillance, testing history information and HIV test to identify recent infections in Lazio, Italy. *BMC Infect Dis.* 12, 65, 2012.
[10] Centro Operativo AIDS (COA), "Aggiornamento delle nuove diagnosi di infezione da HIV dei casi di AIDS in Italia al 31 dicembre 2016," Notiziario Istituto Superiore di Sanità, vol. 30, 2017.
[11] Thornton A.C., Delpech V., Kall M.M., Nardone A. HIV testing in community settings in resource-rich countries: a systematic review of the evidence. *HIV Med*. 7, 416-426, 2012.
[12] World Health Organization. Consolidated guidelines on HIV testing services 2015. World Health Organization, Geneva, Switzerland, 2015.
[13] World Health Organization. Service delivery approaches to HIV testing and counseling (HTC): a strategic HTC program framework. World Health Organization, Geneva, Switzerland, 2012.
[14]. World Health Organization. Rapid HIV tests: guidelines for use in HIV testing and counseling services in resource-constrained settings. World Health Organization, Geneva, Switzerland, 2004.
[15] Figueroa C., Johnson C., Verster A., Baggaley R. Attitudes and acceptability on HIV self-testing among key populations: a literature review. *AIDS Behav.* 11, 1949-1965, 2015.
[16] Deblonde J., Van Beckhoven D., Loos J., et al. HIV testing within general practices in Europe: a mixed-methods systematic review. *BMC Public Health* 18, 1, 1191, 2018.
[17] European Centre for Disease Prevention and Control WHO Regional Office for Europe. HIV/AIDS surveillance in Europe 2015. European Centre for Disease Prevention and Control, Stockholm, 2016.
[18] Cirioni O., Castelletti S., Ucciferri C., et al. Antiretroviral therapy management and rationalization of available resources. *Infez. Med.* 23, 4, 330-335, 2015.
[19] Marotta C., Giaquinto C., Di Gennaro F., et al. Pathways of care for HIV infected children in Beira, Mozambique: pre-post intervention study to assess impact of task shifting. *BMC Public Health* 18, 1, 703, 2018.
[20] Fumo A.M.T., Garofalo N., Chhaganlal K.D., et al. HIV and surgery: An issue only for developed country? an overview from Mozambique. *EuroMediterranean Biomedical Journal.* 11, 92-100, 2016.
[21] Easterbrook P., Johnson C., Figueroa C., Baggaley R. HIV and Hepatitis testing: global progress, challenges, and future directions. *AIDS Rev.*18, 3-14, 2016.
[22] Dias S., Gama A., Simões D., Mendão L. Implementation process and impacts of a participatory HIV research project with key populations. *Biomed. Res. Int.* 5845218, 2018.
[23] Ratmann O., van Sighem A., Bezemer D., et al. Sources of HIV infection among men having sex with men and implications for prevention. *Sci. Transl. Med.* 6, 8, 320-322, 2016.
[24] Galárraga O., Colchero M.A., Wamai R.G., Bertoz-

zi, S.M. HIV prevention cost-effectiveness: a systematic review. *BMC Public Health* 18, 9, S1-S5, 2009.
[25] Flynn D., Johnson C., Sands A., Wong V., Figueroa C., Baggaley R. Uptake of WHO recommended HIV testing strategies: an analysis of national policies on HIV testing services. Poster World Health Organization, Geneva, Switzerland, 2015.
[26] Kosack C.S., Shanks L., Beelaert G., et al. Designing HIV testing algorithms based on 2015 WHO guidelines using data from six sites in Sub-Saharan Africa. *J. Clin. Microbiol.* 55, 10, 3006-3015, 2017.
[27] Burns F., Edwards SG., Woods J., et al. Acceptability, feasibility and costs of universal offer of rapid point of care testing for HIV in an acute admissions unit: Results of the RAPID project. *HIV Medicine.* 14, 3, 10-14, 2013.
[28] Fraisse T., Fourcade C., Brazes-Sanz J., et al. A cross sectional survey of the barriers for implementing rapid HIV testing among French general practitioners. *Int. J. STD AIDS* 27, 11, 1005-1012, 2016.
[29]. McNaghten A.D., Schilsky Mneimneh A., Farirai T. et al. Implementation and Operational Research: Strengthening HIV Test Access and Treatment Uptake Study (Project STATUS): A Randomized Trial of HIV Testing and Counseling Interventions. *J. Acquir. Immune Defic. Syndr*. 70, 4, 140-146, 2015.
[30] Tiziana S., Alexandra G., Graciana P., et al. Strategy for improving access to HIV care for Adolescent and Youth: The experience took place in Beira, Mozambique. *EuroMediterranean Biomedical Journal* 12, 25, 119-124, 2017.
[31] Simit M., Brinkman K., Geerlings S., Smit C., Thyagarajan K., van Sighem A. Future challenges for clinical care of an ageing population infected with HIV: a modelling study. *Lancet Infect. Dis*.15, 810-818, 2015.
[32] Aung E., Blondell SJ., Durham J. Interventions for increasing HIV testing uptake in migrants: a systematic review of evidence. *AIDS Behav.* 21, 10, 2844-2859, 2017.
[33] Harrison K.M., Kajese T., Hall H.I., Song R. Risk factor redistribution of the national HIV/AIDS surveillance data: an alternative approach. *Public Health Rep.* 123, 5, 618-627, 2008.
[34] Wood B.R., Ballenger C., Stekler J.D. Arguments for and against HIV Self Testing. *HIV AIDS*. 2, 6, 117-26, 2014.
[35] World Health Organization. Protocol for performance laboratory evaluation of HIV testing serology (capillary blood). World Health Organization, Geneva, 2017.
[36] Jaspard M., Le Moal G., Saberan-Roncato M., et al. Finger-stick whole blood HIV-1/-2 home-use tests are more sensitive than oral fluid-based in-home HIV tests. *PLoS One* 9, 6, 101-148, 2014.
[37] Ng O.T., Chow A.L., Lee V.J., et al. Accuracy and user-acceptability of HIV self-testing using an oral fluid-based HIV rapid test. *PloS One* 7, 9, 45168, 2012.
[38] Martin-Iguacel R., Pedersen C., Llibre J.M., et al. Primary health care: an opportunity for early identification of people living with undiagnosed HIV infection. *HIV Med.* 20, 6, 404-417, 2019.
[39] Andersson E., Nakagawa F., van Sighem A., et al. Challenges in modelling the proportion of undiagnosed HIV infections in Sweden. *Euro Surveill*. 24, 14, 2019.
[40] Mazzotta E., Riccardi N., Tontodonati M., et al. Prevalence and predictors of malignancies in HIV patients: results of a retrospective multicentric Italian cohort. *Infez. Med.* 1, 27, 53-57, 2019.
[41] Marotta C., Di Gennaro F., Pizzol D., et al. The At Risk Child Clinic (ARCC): 3 Years of Health Activities in Support of the Most Vulnerable Children in Beira, Mozambique. *Int. J. Environ. Res. Public Health* 27, 15, 7, 2018.
[42] Prüss-Ustün A., Wolf J., Driscoll T., Degenhardt L., Neira M., Calleja J.M. HIV due to female sex work: regional and global estimates. *PLoS One* 8, 5, 63476, 2013.