

TUAC0305

Estimating HIV incidence and the undiagnosed HIV population in the European Union / European economic area

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Background: Each year, about 30,000 people are newly diagnosed with HIV in the 31 countries of the European Union/European Economic Area (EU/EEA). We aimed to estimate the number of people living with undiagnosed HIV in the entire EU/EEA and in four sub-regions.

Methods: Annual data on HIV diagnoses in 2003-2015 were retrieved from a database for HIV/AIDS within The European Surveillance System (TESSy). HIV diagnoses were adjusted for reporting delay and stratified by the presence of an AIDS-defining event within 3 months of HIV diagnosis, and, for individuals without AIDS, by CD4 cell count (≥ 500 , 350-499, 200-349, < 200 cells/mm³) at the time of diagnosis. Countries were grouped in sub-regions as defined by United Nations. A back-calculation method based on the ECDC HIV Modelling Tool was used to estimate annual numbers of newly acquired HIV infections, the distribution of time between infection and diagnosis by calendar year, and the number of people still undiagnosed by the end of 2015.

Results: In 2003-2015, there were 403,169 HIV diagnoses: 142,010 (35%) in Western, 121,624 (30%) in Northern, 27,662 (7%) in Eastern, and 111,873 (28%) in Southern Europe. In the entire EU/EEA, 120,100 (95% CI:113,000-127,800) people were estimated to be living with undiagnosed HIV by the end to 2015, of whom 47% had a CD4 count ≥ 500 cells/mm³ and 31% < 350 cells/mm³, with 28,000 (95% CI: 24,700-31,700) new infections in 2015. The estimated number of undiagnosed HIV infections was highest in Southern Europe, while infection rates were highest and time to diagnosis shortest in Northern and Western Europe (Table).

Sub-region	Undiagnosed, total	Undiagnosed, CD4 ≥ 500	Undiagnosed, CD4 < 350	Infection rate [per 100,000 population]	Time to diagnosis (years)		
Western	36,000 32,500-39,600	18,700 16,700-20,800	52%	9,800 9,200-10,700	27%	5.8 5.0-6.8	2.5 [1.2-4.6]
Northern	27,800 25,700-30,700	14,200 12,900-15,900	51%	7,800 7,300-8,400	28%	9.4 8.5-10.8	2.3 [1.1-4.3]
Eastern	12,700 10,900-14,900	5,800 4,800-7,100	46%	4,100 3,600-4,700	32%	3.3 2.4-4.2	3.3 [1.6-6.0]
Southern	42,900 39,800-46,400	17,800 16,000-19,900	41%	15,600 14,900-16,500	36%	3.4 2.1-4.6	3.9 [1.9-7.0]
Total	120,100 113,300-127,800	56,600 52,400-61,000	47%	37,600 35,900-39,300	31%	5.4 4.8-6.2	2.9 [1.4-5.4]

[Undiagnosed population and infection rates]

Conclusions: A substantial number of people in the EU/EEA are living with undiagnosed HIV. Although the estimated CD4 distribution suggests that approximately half of them are in an early stage of infection, a significant proportion are estimated to have late stage infection, suggesting more efforts are needed to test and diagnose these people.