Monitoring Recent HIV Infection in Ireland, 2018

January 2020

Key Facts

- 11% of HIV diagnoses in 2018 (of those tested) were likely to be recent infections (within 4 months), using the Recent Infection Testing Algorithm (RITA), or a p24 antigen positive status.
- By probable routes of transmission, the highest proportion of recent infections were among people who inject drugs (PWID) (21%) followed by men who have sex with men (MSM) (13%).
- Higher proportions of likely recent infections were also seen in young people (15-24 years) (19%); people born in Ireland (27%); and people who acquired their infection in Ireland (23%).
- Some welcome improvements were noted in the quality of HIV surveillance data collected in 2018 which is vital for the interpretation of recency testing.

Suggested citation: HSE Health Protection Surveillance Centre. Monitoring Recent HIV Infection in Ireland, 2018. Dublin: HSE HPSC; 2020

1.0 Background

In order to monitor the ongoing transmission of HIV, it is important to determine the proportion of new diagnoses which are recent. Recent Infection Testing Algorithms (RITA) attempt to differentiate recent from longer standing infections. They combine results of recent infection assays and supplementary laboratory and clinical information that together are used to classify a HIV infection as likely to be recent or not. In addition, the HIV p24 antigen test which is designed to detect a protein (the p24 protein) associated with HIV can be used to indicate acute HIV infection (infected within three weeks of test).

A pilot study on the use of RITA in Ireland was undertaken in 2016 (1). The pilot project demonstrated that it was feasible to combine epidemiological and clinical HIV data from the computerised infectious disease reporting system (CIDR) with avidity results from the National Virus Reference Laboratory (NVRL) and to determine the proportion of recent infections among new HIV diagnoses by applying a RITA algorithm. Following the success of the pilot, HIV avidity testing was included in routine surveillance of HIV in Ireland. This report presents the results of HIV recent infection surveillance in 2018.

2.0 Methods

The NVRL performs confirmatory testing on all new HIV diagnoses in Ireland. Residual sera of newly diagnosed HIV cases in 2018 were tested in the NVRL using the Sedia™ HIV-1 limiting antigen-avidity EIA assay. Results of avidity testing were notified to the relevant Department of Public Health and entered onto CIDR. The RITA classified cases with a numeric avidity result of less than 1.5 as likely to be recent infections (within 4 months) unless there was information available to indicate long-standing infection within the enhanced surveillance data. Criteria used to indicate long-standing infection were one or more of the following: viral load of less than 1000 copies/mL within three months of diagnosis; on anti-retroviral therapy (ART) before or at the time of diagnosis; presence of an AIDS defining illness within three months of diagnosis; and CD4 count of less than 200 cells/µl within three months of diagnosis. Cases with a history of pre-exposure prophylaxis (PrEP) or post-exposure prophylaxis (PEP) use in the previous six months were not classified as recent infections, as use of ART in this context would affect the recency assay results. If there were no epidemiological data available for particular cases, they remained classified as likely recent.

Routine confirmatory testing in the NVRL also includes p24 antigen testing. The p24 antigen test is carried out when a sample is HIV antibody positive, and subsequently negative or ‘indeterminate’ on an HIV line assay test (INNOLIA) or if the first assay is HIV antibody negative and HIV antigen positive. Cases which are p24 antigen positive are likely to have acute infection and are therefore included as likely recent in this analysis.

Results

Avidity testing

There were 522 HIV diagnoses in Ireland in 2018. Of these, 508 (97%) had avidity testing carried out by NVRL and an avidity test result available on CIDR. Reasons for not having an avidity test included insufficient sample, having a p24 antigen positive test (see below) or being a known HIV case in Ireland which was not previously notified. Of those with avidity testing carried out, 128 had an avidity of less than 1.5 indicating likely recent infection. When the RITA algorithm was applied using available epidemiological and clinical data, 80 were classified as false recent (65 were reported to have previously been on ART; 62 had a viral load less than 1000 copies per ml; four had used PEP in the previous six months; three had a CD4 count of less than 200 cells/µl; and one had an AIDS defining illness at time of diagnosis)[1] leaving 48 cases likely to be recent (within 4 months).

Avidity testing plus P24 antigen positives

A total of nine cases in 2018 had a p24 antigen positive result reported by NVRL and available on CIDR, indicating that they were likely to be acute infections. Three of these had also undergone avidity testing and were also deemed to be recent based on RITA while the remaining six had not undergone avidity testing. Combining those who were likely to be recent on avidity testing (n=48) and those that were p24 antigen positive only (n=6) resulted in a total of 54 cases which were likely to be recent (within 4 months). This represents 11% of the total tested in 2018 (with either an avidity test or p24 test) (see Figure 1).

Demographic characteristics of likely recent cases

Table 1 describes the proportion of likely recent infections (as determined by RITA and p24 antigen status) by demographic characteristics. Regarding probable route of transmission, people who inject drugs had the highest proportion of likely recent cases (21%) followed by men who have sex with men (13%), although the number of recent infections among PWID was low (n=3). Higher proportions of recent infections were seen in young people aged15-24 years (19%); those who were born in Ireland (27%); and those who had acquired their infection in Ireland (23%). Figure 2 compares the likely recent infections by demographic group in 2017 and 2018.

People previously diagnosed HIV positive abroad

In 2018, a high proportion (42%) of cases diagnosed in Ireland had been previously diagnosed abroad. In this analysis, we did not use previously diagnosed abroad as a criteria for indicating long-standing infection. However, almost all of these cases (62/63) who had an avidity score of <1.5 and were previously positive abroad fulfilled other criteria

[1] A case may have had more than one criterion for being classified as false recent

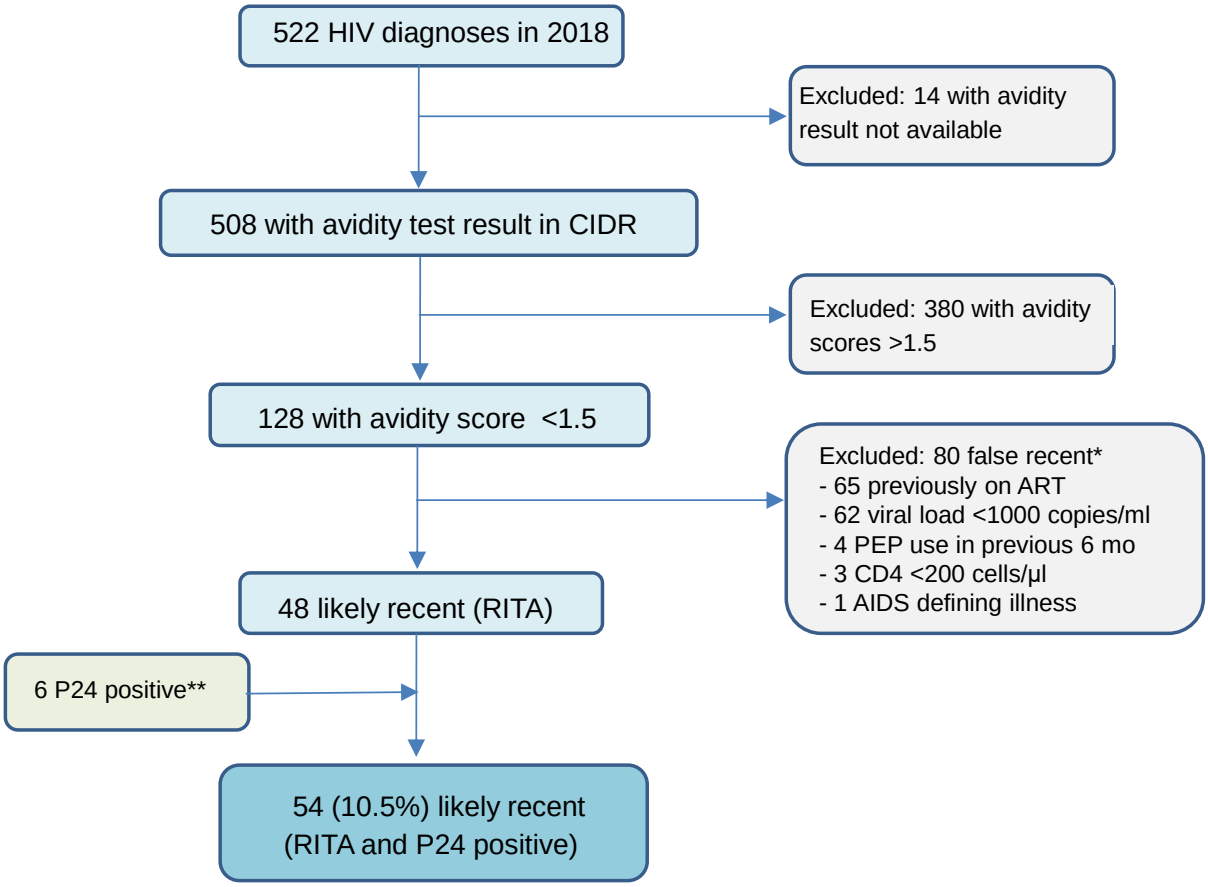
that identified them as false recent cases when the RITA algorithm was applied. If we excluded people who were previously diagnosed abroad from the analysis, the main effect of this would be to reduce the denominator and therefore the proportion recent would be higher (18%).

Completeness of epidemiological data

In order to correctly classifiy cases as likely recent or not, high quality epidemiological data is required. Table 2 describes the completeness of certain key variables in 2017 and 2018 which are used in the RITA to classify cases with an avidity result of <1.5.

Of the 128 cases with an avidity result of <1.5 in 2018, 11 did not have data for any of the key variables. Of the 97 cases with an avidity result <1.5 in 2017, 10 did not have data for any of the key variables. For the purposes of this report, these cases are classified as likely recent but may be false recent.

Figure 1. Likely recent HIV in 2018: RITA and P24 antigen positive



*cases could have more than one reason for being classified as long-standing

**there were nine p24 antigen positive in total, three were likely recent on avidity testing

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Table 1. Demographic characteristics associated with likely recent HIV infections (RITA and p24 positive) in Ireland, 2018

		Recent Infections	Number tested	% recent	95% CI
Total		54	514	10.5	7.9-13.7
Sex	Female	4	105	3.8	1.0-9.8
	Male	50	408	12.3	9.1-16.2
Age Group (years)	15-24	7	37	18.9	7.6-39.0
	25-29	9	95	9.5	4.3-18.0
	30-34	11	120	9.2	4.6-16.4
	35-39	10	83	12.1	5.8-22.2
	40-44	6	52	11.5	4.2-25.1
	45-49	5	56	8.9	2.9-20.8
	50+	6	71	8.5	3.1-18.4
Probable route of transmission	MSM	37	291	12.7	9.0-17.5
	Heterosexual	7	162	4.3	1.7-8.9
	PWID	3	14	21.4	4.4-62.6
Area of residence	HSE East (Dublin, Kildare, Wicklow)	39	370	10.5	7.5-14.4
	Other areas	15	144	10.4	5.8-17.2
Region of birth	Ireland	23	109	21.1	13.4-31.7
	Europe	8	77	10.4	4.5-20.5
	Sub Saharan Africa	2	126	1.6	1.9-5.7
	Latin America & Caribbean	8	135	5.9	2.6-11.7
	Other	1	32	3.1	0.0-17.4
Region of infection	Ireland	20	89	22.5	13.7-34.7
	Outside Ireland	7	207	3.4	1.4-7.0

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Figure 2. Likely recent HIV infections (RITA and P24 positive) by demographic group in Ireland, 2017 and 2018

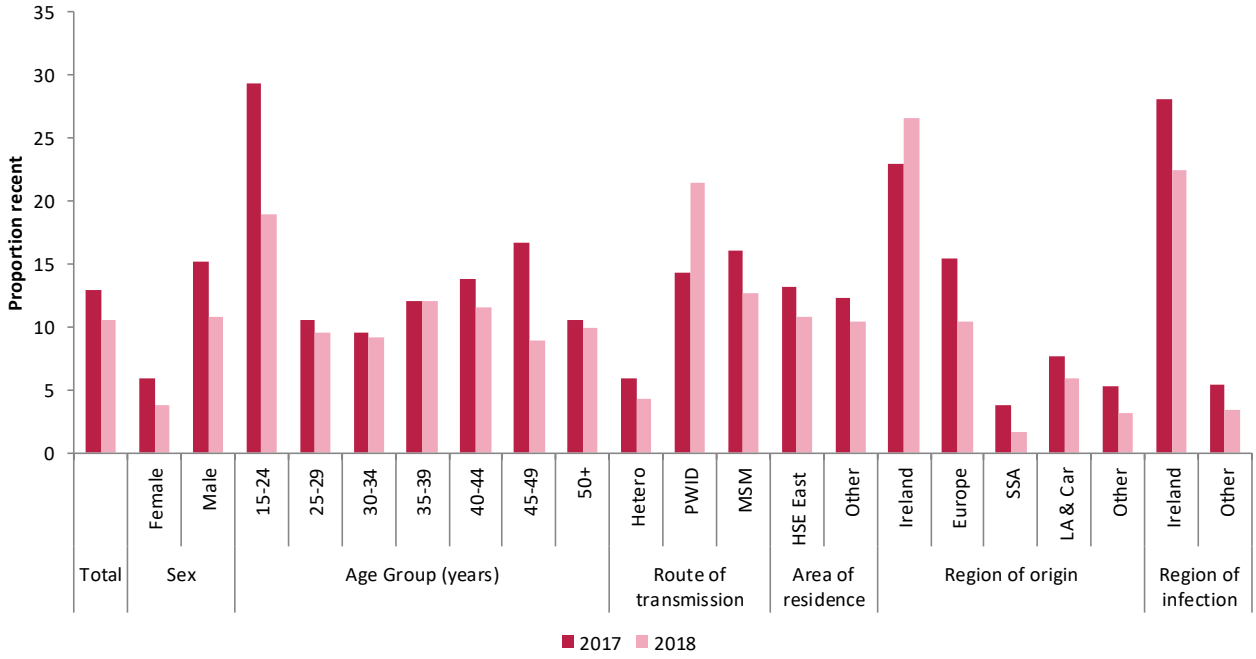

Table 2. Completeness of epidemiological data among cases with avidity <1.5, 2017 and 2018

	Completeness of key variables used in RITA	
	2017 (n=97)	2018 (n=128)
Viral Load at diagnosis	84.5	84.4
CD4 count at diagnosis	75.3	84.4
Clinical Stage at diagnosis	77.3	81.3
History of ART	71.1	89.0
History of PEP/PrEP	60.8	72.7

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Discussion

Surveillance of recent HIV infections among new diagnoses supplements routine HIV surveillance and has been found to be a useful additional tool to monitor the HIV epidemic in Ireland and to identify populations where there is ongoing transmission of HIV. It is important to note that the avidity assay in use in Ireland identifies likely recent infections within four months of infection and therefore other recent infections which have a slightly longer duration of infection will not be included in the proportion likely recent.

Avidity testing was carried out by the NVRL on over 95% of new diagnoses in 2018. A relatively small proportion (11%) were found to be likely recent, slightly lower than the proportion that were found to be recent in 2016 (13%) and 2017 (13%) (1, 2). However, the difference was not statistically significant. The 2018 data indicates some on-going transmission of HIV, with a higher proportion of recent infections among people who inject drugs, men who have sex with men, young people, people born in Ireland and people where the probable country of infection was Ireland.

The proportion of recent infections is a reflection of both HIV incidence and the frequency of HIV testing. Data from previous Healthy Ireland Surveys showed that MSM test for HIV more frequently than heterosexuals (3). Therefore trends in the proportion of recent infections need to be interpreted together with information on HIV testing rates in the overall population and in sub-populations at higher risk. While the proportion of recent infections in Ireland is low, it is of concern that almost half of people diagnosed with HIV in Ireland in 2018 (exluding those previously diagnosed HIV positive abroad) presented late (with a CD4 cell count of less than 350 cells/µl at diagnosis). Population groups with the highest proportion presenting late in 2018 were females, those aged 40 years and older, those born in sub-Saharan Africa, those living outside HSE East and people who inject drugs (PWID). This indicates a need to increase access to HIV testing for key populations to ensure that they are not living with undiagnosed HIV. Once diagnosed these people will have the opportunity to start treatment for their own benefit and to prevent onward transmission to their sexual partners (4, 5).

In their latest surveillance report, Public Health England note that avidity testing was carried out on 38% of people newly diagnosed with HIV in 2018 (6). Of those tested, 18% were likely diagnosed at a recent stage of infection and this varied from 26% among men who have sex with men to 10% among heterosexuals.

Finally, the completeness and quality of HIV surveillance data affects the accuracy of the estimation of recent infection and also impacts on the investigation of factors associated with recent infection. While there were some improvements noted in the quality of data collected in 2018, it is vital that the HIV surveillance data is as complete and comprehensive as possible.

Acknowledgements

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