

SHORT COMMUNICATION

## From epidemiology to innovation: vaccine coverage and viral pathogenesis

### SC 33 Implementing the National Vaccination Plan in People with HIV (PWH): a national survey among ICONA centers

#### Authors

A. Russo<sup>1</sup>, A. Giacomelli<sup>2</sup>, A. De Vito<sup>3</sup>, M. Mazzitelli<sup>4</sup>, M. Ceccarelli<sup>5</sup>, S. De Benedittis<sup>6</sup>, A. Tavelli<sup>3,4</sup>, M. Cernuschi<sup>7</sup>, L. Taramasso<sup>8</sup>, M. Lichtner<sup>9</sup>, V. Mazzotta<sup>10</sup>, E. Girardi<sup>11</sup>, C. Mussini<sup>12</sup>, S. Lo Caputo<sup>13</sup>, A. d'Arminio Monforte<sup>4</sup> on behalf of Icona Foundation Study Group

#### Affiliation

<sup>1</sup>AOU "Luigi Vanvitelli", Unit of Infectious Disease Malattie, Naples, Italy, <sup>2</sup>III Infectious Diseases Unit, ASST Fatebenefratelli-Sacco, DIBIC Luigi Sacco, Università degli Studi di Milano, Milan, Italy, <sup>3</sup>Unit of Infectious Disease, Department of Medicine, Surgery and Pharmacy, University of Sassari, Sassari, Italy, <sup>4</sup>Infectious and Tropical Diseases Unit, Padua University Hospital, Padua, Italy, <sup>5</sup>Unit of Infectious Diseases, School of Medicine and Surgery, "Kore" University of Enna, Enna, Italy, <sup>6</sup>ICONA Foundation, Milan, Italy, <sup>7</sup>A.S.A. Onlus - Association of Solidarity 'AIDS, Italy, <sup>8</sup>Infectious Disease Clinic, IRCCS Ospedale Policlinico San Martino, Genova, Italy, <sup>9</sup>Clinical Infectious Diseases, Sant'Andrea Hospital, Sapienza University of Rome, Rome, Italy, <sup>10</sup>Clinical Infectious Diseases Department, National Institute for Infectious Diseases Lazzaro Spallanzani IRCCS, Rome, Italy, <sup>11</sup>Scientific Direction, National Institute for Infectious Diseases, Lazzaro Spallanzani IRCCS, Rome, Italy, <sup>12</sup>Department of Infectious Diseases, Azienda Ospedaliero-Universitaria di Modena, Policlinico di Modena, University of Modena and Reggio Emilia, Modena, Italy, <sup>13</sup>Clinic of Infectious Diseases, Department of Clinical and Surgical Sciences, University of Foggia, Foggia, Italy, <sup>14</sup>National PhD Programme in One Health approaches to infectious diseases and life science research, Department of Public Health, Experimental and Forensic Medicine, University of Pavia, Pavia, Italy

#### ABSTRACT

**Background:** We aimed to assess adherence to the Italian National Vaccination Plan (NVP) and differences in vaccination practices among people with HIV (PWH) in centers participating in the ICONA cohort.

**Methods:** A cross-sectional survey was conducted online in Jan-Feb 2025 to all ICONA cohort centers requesting information about center features (geographic localization, number of PWH in care, type of center), type, number, and modality of vaccine offering, and investigating possible barriers to NVP implementation. Vaccinations were grouped into sexually transmitted infections (STI-V) (HAV, HBV, HPV, Mpox); seasonal (S-V) (SARS-CoV-2); age and immunodepression related (A-V) (dTP, anti-Zoster, and others).

**Results:** 59 out of 61 ICONA centers completed the survey: 47.5% in Northern Italy, 18.6% in Central Italy, and 33.9% in Southern Italy, with 50.8% being academic centers. The distribution of PWH in care (<500, 500–1000, >1000) varied significantly by region ( $p=0.009$ ), with most centers (60.7%) following >1000 PWH being in Northern Italy. Regarding the vaccination offer, 37.3% of centers could provide on-site vaccinations at Infectious Diseases Units, 27.1% had a hospital-based service, and 35.6% referred PWH to an out-of-hospital local vaccination service (Table 1). Either PWH or doctors could make vaccination booking in 65.4% of centers in Northern Italy and in 9.1% of centers in Central Italy ( $p=0.024$ ). Vaccinations were offered at the time of engagement in care in 47.5% centers, while in 45.8%, vaccinations were started within a year. The lack of registry access was more frequent in Southern Italy and Central Italy compared to Northern Italy (Table 1). Most centers (96.6% to 91.5%) offer STI-V, apart from Mpox, which is offered only in 42.4%. S-V. In particular, SARS-CoV-2 was provided in 47.5% of centers, and A-V from 96.6% to 54.2%. PWH's hesitancy (55.9%) was the primary barrier reported, followed by a lack of dedicated staff (32.2%) and organizational constraints (25.4%). Considering STI-V, there wasn't a substantial difference between geographic areas, except for Mpox, whose offer varied widely, with a higher rate in Central Italy, 72.7%, and less than 40% in South and Northern Italy. Mid-sized centers expressed more concerns about a lack of staff. Centers reported low PWH's hesitancy (11.9%) for non-Italian born. Notably, 86.2% provided free vaccinations for those with a code for temporary health service (STP), while 64.9% did so for European Non-Italian (ENI)-coded individuals. However, 12.3% did not cover people with ENI-code, and 22.8% stated that their region did not accept ENI-coded individuals. Finally, 49.2% of centers had trained staff in the NVP, with rates ranging from 64.3% in North to 18.2% in Central Italy (Table 1).

**Discussion:** This study showed marked disparities in vaccination offers, pathways, and registry accessibility across Italian HIV centers. Addressing these issues will foster and optimize broader adherence to vaccinations for PWH.

Table 2

Table 1. Centers' responses to the survey grouped by geographic area

Question	Total, n=59	Northern Italy, n=28	Central Italy, n=11	Southern Italy, n=20	p-value
Number (%) of PWH in care:					
• <500	10(16.9)	1(3.6)	2(18.2)	7(35)	0.009
• 500-1000	25(42.4)	10(35.7)	5(45.5)	10(50)	
• >1000	24(40.7)	17(60.7)	4(36.4)	3(15)	
Type of centre:					
• Academic	30(50.8)	15(53.6)	6(54.4)	9(45)	0.812
• Non-academic	29(49.2)	13(46.4)	5(45.5)	11(55)	
By whom are the vaccines administered?					
• Vaccination service inside the clinic	22(37.3)	14(50)	4(36.4)	4(20)	0.080
• Vaccination service within the hospital facility	16(27.1)	6(21.4)	1(9.1)	9(45)	
• Territorial (local) vaccination service	21(35.6)	8(28.6)	6(54.4)	7(35)	
Method of referral to the vaccination centre:					
• Both of the below responses	28(49.1)	17(65.4)	1(9.1)	10(50)	0.024
• Direct appointment booking by the infectious disease specialist	18(31.6)	6(23.1)	5(45.5)	7(35)	
• Appointment booking independently by the patient	11(19.3)	3(11.5)	5(45.5)	3(15)	
How soon is the start of the vaccination program offered at your centre?					
• At first visit	28(47.5)	12(42.9)	4(36.4)	12(60)	0.725
• Within one year from the first visit	27(45.8)	14(50)	6(54.5)	7(35)	
• After one year from first visit	4(6.8)	2(7.1)	1(9.1)	1(5)	
How are people informed about the vaccination offer?					
• Verbally	59(100)	28(100)	11(100)	11(100)	-
• With the help of infographic	6(10.2)	3(10.7)	0(0)	3(15)	0.414
• Through dedicated patient material	5(8.5)	2(7.1)	2(18.2)	1(5)	0.425

Does the infectious disease specialist have access to the vaccination registry?					
• No access	26(44.8)	7(25.9)	6(54.5)	13(65)	0.022
• Yes, regional	32(55.2)	20(74.1)	5(45.5)	7(35)	
Which of the following vaccinations does your centre currently offer?					
• Human Papillomavirus (STI-V) (A-V)	55(93.2)	27(96.4)	10(90.9)	18(90)	0.645
• Anti-Pneumococcal (A-V)	55(93.2)	27(96.4)	9(81.8)	19(95)	0.244
• Anti-Meningococcal (A-V)	50(84.7)	27(96.4)	9(81.8)	14(70)	0.041
• Anti H. influenza (A-V)	43(72.9)	25(89.3)	7(63.6)	11(55)	0.023
• Measles-Mumps-Rubella (A-V)	38(64.4)	21(75)	6(54.5)	9(45)	0.271
• Chickenpox (excluding Zooster) (A-V)	32(54.2)	18(64.3)	5(45.5)	18(90)	0.338
• HBV (A-V) (STI-V)	57(96.6)	28(100)	11(100)	17(85)	0.133
• HAV (STI-V)	54(91.5)	28(100)	9(81.8)	18(90)	0.081
• Anti-Zoster (A-V)	55(93.2)	27(96.4)	10(90.9)	9(45)	0.645
• Anti Difteria/Tetanus/Pertussis (A-V)	37(62.7)	22(78.6)	6(54.5)	5(25)	0.050
Does your centre offer SARS-CoV-2 (S-V) vaccinations?					
• In the past	21(35.6)	9(32.1)	7(63.6)	5(25)	0.236
• Never offered	10(16.9)	6(21.4)	1(9.1)	3(15)	
• Yes, currently	28(47.5)	13(46.4)	3(27.3)	12(60)	
Does your centre offer Mpox (STI-V) vaccinations?					
• In the past	14(23.7)	11(39.3)	1(9.1)	2(10)	0.005
• Never offered	20(33.9)	6(21.4)	2(18.2)	12(60)	
• Yes, currently	25(42.4)	11(39.3)	8(72.7)	6(30)	
Which appears to be the main barrier encountered in the NVP?					
• People vaccine hesitancy	33(55.9)	19(67.9)	5(45.5)	9(45)	0.215
• Healthcare professional vaccine hesitancy	2(3.4)	1(3.6)	0(0)	1(5)	0.761
• Lack of dedicated staff	19(32.2)	10(35.7)	5(45.5)	4(20)	0.300
• Organizational barriers in the local area	15(25.4)	9(32.1)	2(18.2)	4(20)	0.527
• Healthcare personnel training	1(1.7)	0(0)	0(0)	1(5)	0.371
• Centre not identified as a regional vaccination centre	12(20.3)	3(10.7)	3(27.3)	6(30)	0.214
• No vaccine available at centre	10(16.9)	4(14.3)	3(27.3)	3(15)	0.598
• Lack of suitable facilities for administration	1(1.7)	1(3.6)	0(0)	0(0)	0.569
• Lack of an appropriate refrigerator	0(0)	0(0)	0(0)	0(0)	-

Are vaccinations offered free of charge to PWH with STP-code?					
• Yes	50(86.2)	24(88.9)	8(72.7)	18(90)	0.352

Are vaccinations offered free of charge to PWH with ENI-code?					
<ul style="list-style-type: none"> <li>No</li> <li>ENI code not provided in the region</li> <li>Yes</li> </ul>	7(12.3) 13(22.8) 37(64.9)	3(11.1) 6(22.2) 18(66.7)	2(18.2) 5(45.5) 4(36.4)	2(10.5) 2(10.5) 15(78.9)	0.192
Have non-Italian patients encountered more issues?	© Effetti srl P. IVA 10756900154				
<ul style="list-style-type: none"> <li>Yes</li> </ul>	30(50.8)	14(50)	7(63.6)	9(45)	0.606
If so, which ones?					
<ul style="list-style-type: none"> <li>Patient vaccine hesitancy</li> <li>Bureaucratic issues</li> <li>Vaccination not offered free of charge</li> <li>Logistical issues</li> </ul>	7(11.9) 22(37.3) 5(8.5) 16(27.1)	3(10.7) 10(35.7) 2(7.1) 7(25)	3(27.3) 7(63.6) 2(18.2) 6(54.5)	1(5) 5(25) 1(5) 3(15)	0.180 0.101 0.425 0.057
Do you engage in external collaborations to expand the vaccination offer?					
<ul style="list-style-type: none"> <li>Yes</li> </ul>	20(33.9)	10(35.7)	3(27.3)	7(35)	0.875
Has your center's staff received specific training on the national vaccination plan?					
<ul style="list-style-type: none"> <li>Yes</li> </ul>	29(49.2)	18(64.3)	2(18.2)	9(45)	0.031

Table 2. Centers' responses to the survey grouped by number of PLWH followed up

Question	Total, n=59	<500 PWH n=10	500-1000 PWH n=25	>1001 PWH n=24	p-value
Geographic area					

<ul style="list-style-type: none"> <li>Northern Italy</li> <li>Central Italy</li> <li>Southern Italy</li> </ul>	28(47.5) 11(18.6) 20(33.9)	1(10) 2(20) 7(70)	10(40) 5(20) 10(40)	17(70.8) 4(16.7) 3(12.5)	0.009
Type of center:					
<ul style="list-style-type: none"> <li>Accademic</li> <li>Non-accademic</li> </ul>	30(50.8) 29(49.2)	4(40) 6(60)	11(44) 14(56)	15(62.5) 9(37.5)	0.326
By whom are the vaccines administered?					
<ul style="list-style-type: none"> <li>Vaccination service inside the clinic</li> <li>Vaccination service within the hospital facility</li> <li>Territorial (local) vaccination service</li> </ul>	22(37.3) 16(27.1) 21(35.6)	3(30) 4(40) 3(30)	6(24) 6(24) 13(52)	13(54) 7(29.2) 5(20.8)	0.119
Method of referral to the vaccination center:					
<ul style="list-style-type: none"> <li>Both of the below responses</li> <li>Direct appointment booking by the infectious disease specialist</li> <li>Appointment booking independently by the patient</li> </ul>	28(49.1) 18(31.6) 11(19.3)	4(40) 4(40) 2(20)	8(34.8) 7(30.4) 8(34.8)	16(66.7) 7(29.2) 1(4.2)	0.071
How soon is the start of the vaccination program offered at your center?					
<ul style="list-style-type: none"> <li>At first visit</li> <li>Within one year from the first visit</li> <li>After one year from first visit</li> </ul>	28(47.5) 27(45.8) 4(6.8)	6(60) 4(40) 0(0)	13(52) 9(36) 3(12)	9(37.5) 14(58.3) 1(4.2)	0.368
How are patients informed about the vaccination offer?					
<ul style="list-style-type: none"> <li>Verbally</li> <li>With the help of infographic</li> <li>Through dedicated patient material</li> </ul>	59(100) 6(10.2) 5(8.5)	10(100) 3(30) 1(10)	25(100) 1(4) 2(8)	24(100) 2(8.3) 2(8.3)	- 0.066 0.981
Does the infectious disease specialist have access to the vaccination registry?					
<ul style="list-style-type: none"> <li>No access</li> <li>Yes, regional</li> </ul>	26(44.8) 32(55.2)	5(50) 5(50)	17(70.8) 7(29.2)	4(16.7) 2(8.3)	0.007
Which of the following vaccinations does your center currently offer?					
<ul style="list-style-type: none"> <li>Human Papillomavirus</li> <li>Anti-Pneumococcal</li> <li>Anti-Meningococcal</li> </ul>	55(93.2) 55(93.2) 50(84.7)	10(100) 9(90) 9(90)	24(96) 24(96) 19(76)	21(87.5) 22(91.7) 22(91.7)	0.321 0.755 0.275

<ul style="list-style-type: none"> <li>Anti H. influenza</li> <li>Measles-Mumps-Rubella</li> <li>Chickenpox (excluding Zooster)</li> <li>HBV</li> <li>HAV</li> <li>Anti-Zoster</li> <li>Anti Difteria/Tetanus/Pertussis</li> </ul>	43(72.9) 38(64.4) 32(54.2) 57(96.6) 54(91.5) 55(93.2) 37(62.7)	8(80) 8(80) 7(70) 10(100) 10(100) 10(100) 8(80)	16(64) 14(56) 11(44) 24(96) 22(88) 23(92) 12(48)	19(79.2) 16(66.7) 14(58.3) 23(95.8) 22(91.7) 22(91.7) 17(70.8)	0.420 0.390 0.330 0.809 0.515 0.645 0.118
Does your center offer SARS-CoV-2 vaccinations?					
<ul style="list-style-type: none"> <li>In the past</li> <li>Never offered</li> <li>Yes, currently</li> </ul>	21(35.6) 10(16.9) 28(47.5)	3(30) 2(20) 5(50)	9(36) 4(16) 12(48)	9(37.5) 4(16.7) 11(45.8)	0.995

Does your center offer Mpox vaccinations?					
• In the past	14(23.7)	3(30)	3(12)	8(33.3)	0.228
• Never offered	20(33.9)	5(50)	9(36)	6(25)	
• Yes, currently	25(42.4)	2(20)	13(52)	10(41.7)	
Which appears to be the main barrier encountered in the vaccination plan?					
• Patient vaccine hesitancy	33(55.9)	6(60)	9(36)	18(75)	0.022
• Healthcare Personnel vaccine hesitancy	2(3.4)	1(10)	0(0)	1(4.2)	0.324
• Lack of dedicated staff	19(32.2)	3(30)	9(36)	7(29.2)	0.866
• Organizational barriers in the local area	15(25.4)	4(40)	3(12)	8(33.3)	0.117
• Healthcare personnel training	1(1.7)	1(10)	0(0)	0(0)	0.083
• Center not identified as a regional vaccination center	12(20.3)	3(30)	9(36)	0(0)	0.005
• No vaccine available at center	10(16.9)	2(20)	6(24)	2(8.3)	0.330
• Lack of suitable facilities for administration	1(1.7)	0(0)	1(4)	0(0)	0.501
• Lack of an appropriate refrigerator	0(0)	0(0)	0(0)	0(0)	-
Are vaccinations offered free of charge to PWH with STP-code?					
• Yes	50(86.2)	8(80)	21(84)	21(91.3)	0.628
Are vaccinations offered free of charge to PWH with ENI-code?					
• No	7(12.3)	0(0)	6(24)	1(4.3)	0.079
• ENI-code not provided in the region	13(22.8)	4(44)	5(20)	4(17.4)	
• Yes	37(64.9)	5(55.6)	14(56)	18(78.3)	

Have non-Italian patients encountered more issues?					
• Yes	30(50.8)	5(50)	11(44)	14(58.3)	0.604
If so, which ones?					
• Patient vaccine hesitancy	7(11.9)	2(20)	3(12)	2(8.3)	0.631
• Bureaucratic issues	22(37.3)	4(40)	8(32)	10(41.7)	0.768
• Vaccination not offered free of charge	5(8.5)	2(20)	0(0)	3(12.5)	0.104
• Logistical issues	16(27.1)	2(20)	6(24)	8(33.3)	0.654
Do you engage in external collaborations to expand the vaccination offer?					
• Yes	20(33.9)	4(40)	8(32)	8(33.3)	0.900
Has your center's staff received specific training on the national vaccination plan?					
• Yes	29(49.2)	4(40)	10(40)	15(62.5)	0.236