Changing demographics and immunity to vaccine preventable diseases in people with HIV in Ireland

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Introduction

HIV infection is associated with an increased risk of morbidity and mortality from vaccine preventable infections. This research describes, in the context of changing patient demographics, the seroprevalence of vaccine preventable viral infections among attendees of the largest centre for HIV positive patients in Ireland.

Methods

Baseline serum IgG results for measles, mumps, rubella, varicella zoster virus (VZV) & hepatitis A, as well as hepatitis B sAg, cAb and sAb results, were retrieved for 2534 clinic attendees in 2018. Results were available for between 990 and 2363 attendees (39% - 93%), depending on the test, and were compared with 2013 clinic data.

Results

	Measles IgG (n=990)					Mumps IgG (n=998)					Rubella IgG (n=997)					VZV IgG (n=1522)				
	Positive	%	Negative	%	P value	Positive	%	Negative	%	P value	Positive	%	Negative	%	P value	Positive	%	Negative	%	P value
Overall	827	84%	163	16%		827	83%	171	17%		884	89%	113	11%		1452	95%	70	5%	
Gender (M/F)	655 / 172	82% / 90%	144 / 19	18% / 10%	0.007	663 / 164	82% / 86%	144 / 27	18% / 16%	0.221	716 / 168	90% / 85%	83 / 30	10% / 15%	0.058	1127 / 325	96% / 94%	49 / 21	4% / 6%	0.137
MSM	502	80%	128	20%	<0.001	511	81%	123	19%	0.012	557	88%	73	12%	0.741	841	96%	38	4%	0.548
Heterosexual	270	92%	25	8%	<0.001	258	87%	40	13%	0.042	269	89%	33	11%	0.789	479	95%	23	5%	0.982
PWID	44	92%	4	8%	0.119	47	96%	2	4%	0.013	46	96%	2	4%	0.108	103	93%	8	7%	0.173
Other	11	65%	6	35%	0.035	11	65%	6	35%	0.045	12	71%	5	29%	0.018	29	97%	1	3%	0.738
Ireland	293	93%	21	7%	<0.001	273	85%	47	15%	0.159	292	92%	24	8%	0.011	567	97%	18	3%	0.025
Europe	139	75%	47	25%	<0.001	153	82%	34	18%	0.673	166	88%	22	12%	0.86	267	95%	15	5%	0.523
Africa	170	91%	16	9%	0.001	168	90%	19	10%	0.005	166	88%	22	12%	0.86	288	95%	15	5%	0.744
South America	156	68%	73	32%	<0.001	174	76%	55	24%	0.002	201	88%	28	12%	0.627	239	94%	15	6%	0.276
Asia & Australasia	47	96%	2	4%	0.017	41	84%	8	16%	0.878	40	80%	10	20%	0.047	62	91%	6	9%	0.089
North America	22	85%	4	15%	0.88	18	69%	8	31%	0.062	19	73%	7	27%	0.011	29	97%	1	3%	0.738
Median age in years (IQR)	38 (32 - 46)		32 (29 - 36)		<0.001	37 (32 - 45)		34 (29 - 40)		<0.001	37 (32 - 45)		33 (29 - 39)		<0.001	39 (33 - 47)		37 (31 - 41)		0.008

	Hepatitis A IgG (n=2294)					Hepatitis B sAg (n=2322)					Hepatitis B cAb (n=1879)					Hepatitis B sAb ≥ 10mIU (n=2363)				
	Positive	%	Negative	%	P value	Positive	%	Negative	%	P value	Positive	%	Negative	%	P value	Positive	%	Negative	%	P value
Overall	1806	79%	488	21%		63	3%	2259	97%		610	32%	1269	68%		1501	64%	862	36%	
Gender (M/F)	1287 / 519	75% / 88%	420 / 68	25% / 12%	<0.001	46 / 17	3% / 3%	1673 / 586	97% / 97%	0.852	431 / 179	30% / 40%	997 / 272	70%/ 60%	<0.001	1146 / 355	66% / 58%	602 / 260	34% / 42%	0.001
MSM	813	70%	341	30%	<0.001	16	1%	1124	99%	<0.001	244	25%	733	75%	<0.001	825	71%	339	29%	<0.001
Heterosexual	700	87%	105	13%	<0.001	38	5%	775	95%	<0.001	235	38%	388	62%	0.001	464	56%	362	44%	<0.001
PWID	263	89%	31	11%	<0.001	8	2%	316	98%	0.771	122	50%	120	50%	<0.001	186	56%	144	44%	0.004
Other	30	73%	11	27%	0.431	1	2%	44	98%	0.838	9	24%	28	76%	0.294	26	60%	17	40%	0.674
Ireland	848	81%	198	19%	0.015	12	1%	1060	99%	<0.001	233	29%	578	71%	0.004	712	63%	424	37%	0.412
Europe	235	65%	128	35%	<0.001	14	4%	343	96%	0.127	111	34%	213	66%	0.46	230	65%	123	35%	0.489
Africa	471	97%	17	3%	<0.001	29	6%	469	94%	<0.001	182	48%	198	52%	<0.001	295	60%	200	40%	0.041
South America	161	58%	117	42%	<0.001	2	1%	272	99%	0.031	55	21%	209	79%	<0.001	184	70%	78	30%	0.017
Asia & Australasia	65	79%	17	21%	0.812	5	6%	80	94%	0.067	23	33%	47	67%	0.92	58	71%	24	29%	0.167
North America	26	70%	11	30%	0.239	1	3%	35	97%	0.981	6	18%	27	82%	0.8	22	63%	13	37%	0.934
Median age in years (IQR)	43 (36 - 51)		36 (30 - 43)		<0.001	45 (38 - 49)		41 (35 - 50)		0.148	45 (38 - 53)		38 (32 - 46)		<0.001	42 (35 - 50)		41 (35 - 50)		0.772

	Odds Ratio	95% Confidence Interval		P value
Measles IgG negativity				
Female gender	0.84	0.37	1.90	0.675
Increasing age (by year)	0.91	0.88	0.94	<0.001
MSM	0.53	0.15	1.87	0.323
Heterosexual	0.42	0.13	1.42	0.165
PWID	0.65	0.12	3.42	0.612
Other	1.00			
Ireland	0.45	0.14	1.51	0.196
Europe	2.14	0.67	6.83	0.200
Africa	0.64	0.17	2.41	0.511
South America	1.85	0.59	5.78	0.291
Asia and Australasia	0.23	0.04	1.39	0.108
Mumps IgG negativity				
Increasing age (by year)	0.97	0.95	0.99	0.001
MSM	0.29	0.09	0.91	0.034
Heterosexual	0.35	0.11	1.06	0.064
PWID	0.07	0.01	0.45	0.005
Other	1.00			
Ireland	0.93	0.59	1.49	0.770
Africa	0.42	0.21	0.82	0.012
South America	1.26	0.79	2.03	0.332
North America	2.09	0.84	5.20	0.111

	Odds Ratio	95% Confidence Interval		P value
Rubella IgG negativity				
Female gender	1.63	1.02	2.61	0.042
Increasing age (by year)	0.96	0.94	0.98	0.001
PWID	0.53	0.12	2.28	0.391
Other	2.10	0.69	6.42	0.193
Ireland	0.80	0.48	1.32	0.376
Asia and Australasia	2.23	1.05	4.72	0.036
North America	3.37	1.34	8.47	0.010
VZV IgG negativity				
Female gender	1.47	0.86	2.51	0.163
Increasing age (by year)	0.96	0.94	0.99	0.007
PWID	3.11	1.32	7.31	0.009
Ireland	0.56	0.30	1.04	0.067
Asia and Australasia	1.98	0.81	4.87	0.135

	Odds Ratio	95% Confidence Interval		P value
Hepatitis A IgG negativity				
Female gender	0.75	0.50	1.11	0.146
Increasing age (by year)	0.94	0.93	0.96	<0.001
MSM	0.51	0.22	1.17	0.111
Heterosexual	0.61	0.26	1.42	0.254
PWID	0.23	0.09	0.57	0.001
Ireland	1.10	0.69	1.77	0.682
Europe	1.84	1.13	3.01	0.015
Africa	0.12	0.06	0.24	<0.001
South America	1.67	1.00	2.76	0.048
Hepatitis B sAg positivity				
Increasing age (by year)	1.02	0.99	1.05	0.190
MSM	0.43	0.18	1.06	0.066
Heterosexual	0.83	0.35	1.95	0.664
Ireland	0.28	0.03	2.26	0.231
Europe	1.26	0.16	10.02	0.825
Africa	1.31	0.16	10.57	0.801
South America	0.33	0.03	3.80	0.373
Asia and Australasia	1.91	0.21	17.20	0.562

	Odds Ratio	95% Confidence Interval		P value
Hepatitis B cAb positivity				
Female gender	1.09	0.81	1.48	0.572
Increasing age (by year)	1.06	1.05	1.08	<0.001
MSM	1.43	0.61	3.35	0.405
Heterosexual	1.01	0.44	2.31	0.985
PWID	4.60	1.92	11.01	0.001
Ireland	0.44	0.33	0.59	<0.001
Africa	2.28	1.56	3.31	<0.001
South America	0.84	0.57	1.23	0.361
Hepatitis B sAb <10mIU				
Female gender	0.91	0.72	1.16	0.454
MSM	0.55	0.29	1.04	0.068
Heterosexual	1.23	0.65	2.30	0.525
PWID	1.05	0.54	2.04	0.878
Africa	0.81	0.62	1.05	0.109
South America	0.97	0.72	1.31	0.854

There was a 35% increase in attendees in 2018 when compared to 2013 (1881 to 2534). The largest increase was in attendees of South American origin. In 2018, 48% of attendees were MSM and males accounted for 73% of the cohort. 47% of attendees were originally from Ireland.

Among those tested, 33% were susceptible to at least one component of the MMR vaccine. 5% were VZV non-immune (significantly associated with younger age and PWID status). 21% were hepatitis A non-immune (significantly associated with younger age and being of European or South American origin). 32% were hepatitis B cAb seropositive (significantly associated with older age, PWID status and being originally from Africa). 3% demonstrated hepatitis B sAg positivity. 64% had hepatitis B sAb ≥ 10mIU.

Conclusion

In a cohort of attendees to an HIV clinic in a large urban setting, the susceptibility to several common vaccine preventable viral infections, in particular MMR and hepatitis A and B, was high. Healthcare staff and patients should be counselled on prevalence of susceptibility against these vaccine preventable viruses.