

# The Impact of Migration on Immune Status to MMR in newly-presenting patients living with HIV infection to a Dublin hospital

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## Background

Global migration plays a role in disease spread and changes in patterns of infectious disease worldwide. In 2022, there was an increase in the number of new HIV diagnoses in Ireland, largely attributable to increased migration, with the majority of patients having a pre-existing diagnosis made outside of Ireland.<sup>(1)</sup> In 2023, 141,600 people immigrated to Ireland, of these 29600 returning Irish citizens, 26100 other EU citizens and 4800 UK citizens, the remaining 81,100 were citizens of other countries.<sup>(2)</sup>

There has been a recent outbreak of measles in Ireland, occurring at a time of decreased uptake of in MMR1 and MMR2 in the general population to <90% (below the 95% recommended by WHO).<sup>(3)(4)</sup>

## Methods

Data for all new attendees to the HIV clinics in 2023 was obtained through the electronic medical record, including new diagnosis HIV and transfer of HIV care from other centres, within Ireland and abroad.

Data was collected pertaining to demographics, including, patient factors; gender, age, social factors i.e.. Homelessness, mode of acquisition of HIV (subdivided into Heterosexual, People Who Inject Drugs (PWID), Gay, Bisexual, and other men-who-have-sex-with-men (gbMSM)). Geographic origin was included; subdivided into Asia, Eastern Europe (E. Europe), Ireland, North America (N. America), South America (S. America), Sub-Saharan Africa (SS Africa), and Western Europe (W. Europe).

Laboratory markers such as CD4 count and viral load at presentation, measles IgG and rubella IgG were recorded also. Based on these, whether the MMR was appropriately given was recorded, and if it was not given the reason for same was included; including contraindications (e.g. CD4 <200, pregnancy), and patient choice to decline despite counselling.

For the purposes of this study, we only looked at the serostatus for measles and rubella, we did not collate data for mumps.

The department hosts an in-house vaccine unit, established in 2002. We also gathered data regarding Influenza vaccination, specifically Influenza vaccine uptake in our aforementioned cohort, also documenting in the event it was not given the reasons for this. We used this comparative vaccine, as a marker of vaccine uptake.

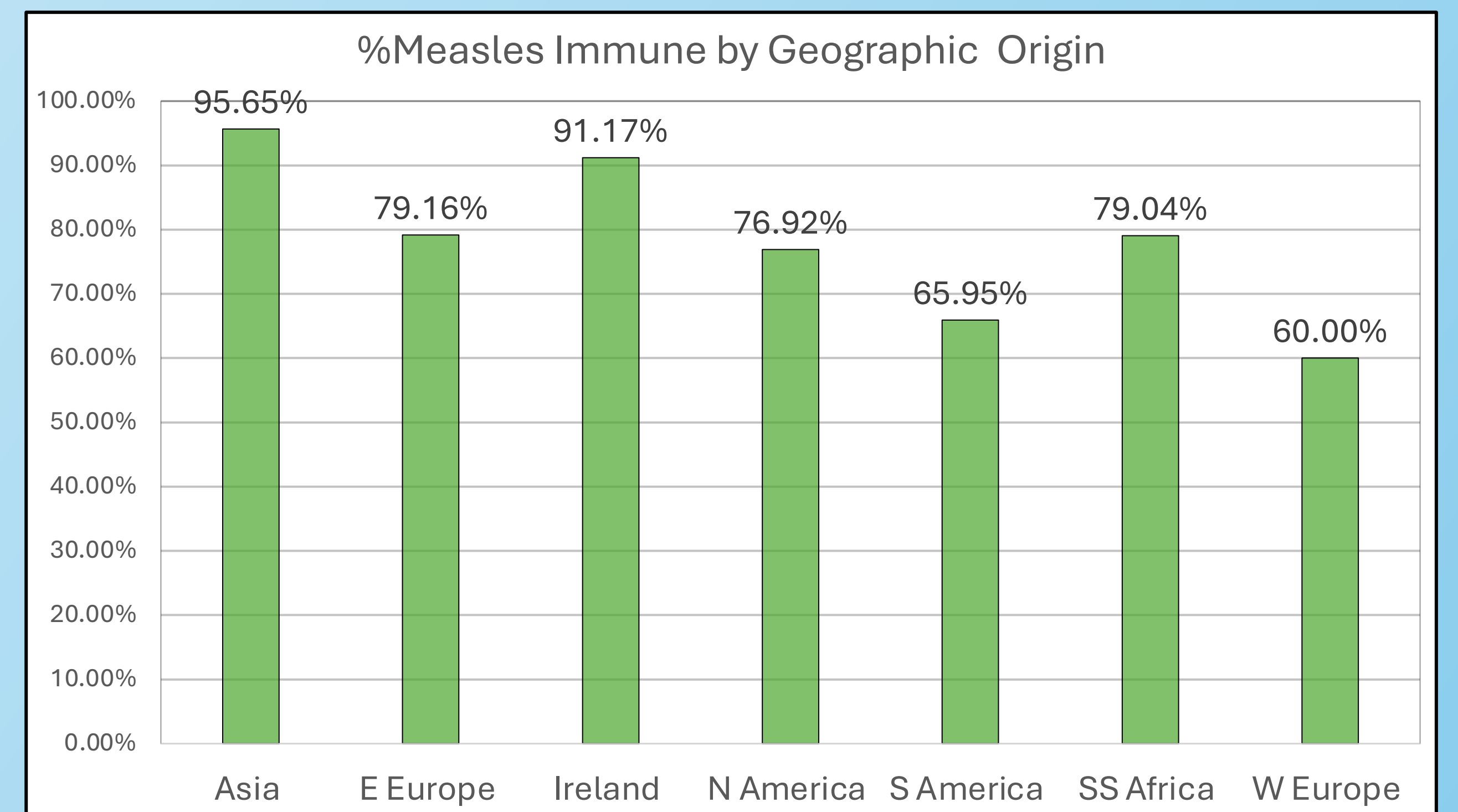
## Results

327 new patients living with HIV infection attended in 2023; 242 (74%) male and 85 female (26%). Mean age +/-SD = 38.8 +/- 9.6, with a mean CD4 = 590 +/- 305 (SD). We further subdivided the patient population by geographical origin; Asia = 23 (7.0%), Eastern Europe = 48 (14.7%), Ireland = 34 (10.4%), N America = 13 (4.0%), S America = 94 (28.7%), SS Africa = 105 (32.1%), Western Europe = 10 (3.1%).

Measles IgG; Positive/immune = 252 (77.1%), Negative/non-immune = 70 (21.4%), IgG status not available = 5 (1.5%). Rubella IgG Positive/immune = 282 (86.2%); Negative/non-immune = 38 (11.6%), IgG status not available = 7 (2.1%)

MMR vaccine was indicated in 77 patients; (70 for measles and 7 for rubella in women of child-bearing age). Of those in which the vaccine was indicated 38/77 did not receive (49.4%); 12 had a contraindication (15.6%) (6 pregnant (7.8%) 6 low CD4 (7.8%)), 5 (6.5%) declined despite advice.

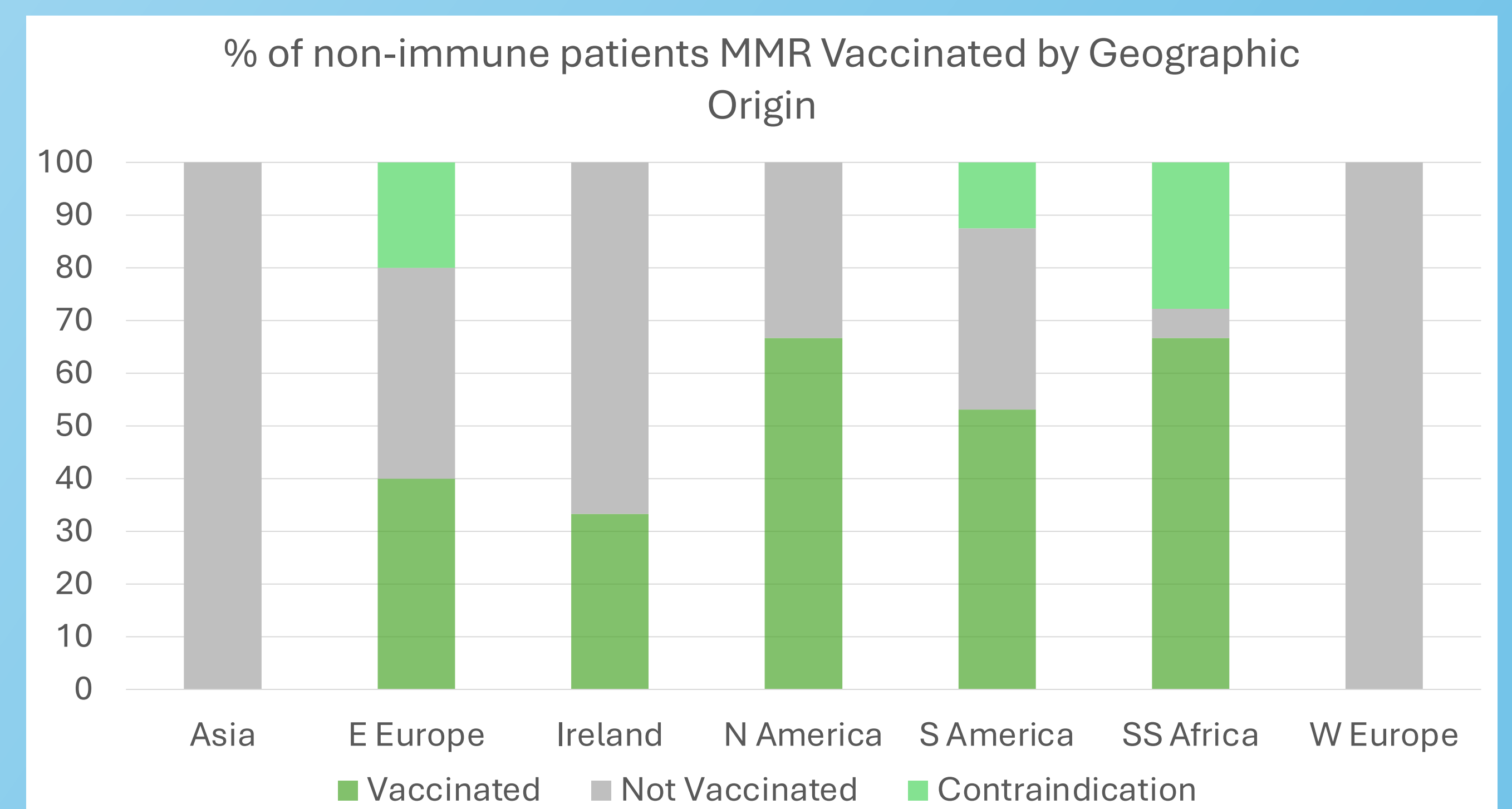
Demographic factors	Measles Immune	Measles Non-Immune	
<b>Gender</b>			
Male	184/252 (73.0%)	54/70 (77.1%)	
Female	68/252 (27.0%)	16/70 (22.9%)	
Mean Age	40	35	OR 0.9 p<0.001
<b>Mode of Acquisition HIV</b>			
Heterosexual	108/252 (42.9%)	21/70 (30.0%)	
PWID	8/252 (3.2%)	3/70 (4.3%)	
gbMSM	131/252 (52.0%)	45/70 (64.3%)	
Vertical	5/252 (2.0%)	1/70 (1.4%)	
<b>Geographic Origin</b>			
Asia	22/252 (8.7%)	1/70 (1.4%)	P = .53
E Europe	38/252 (15.2%)	10/70 (14.3%)	P = .15
Ireland	31/252 (12.3%)	3/70 (4.3%)	Reference
N America	10/252 (4.0%)	3/70 (4.3%)	P = .21
S America	62/252 (24.6%)	32/70 (45.7%)	<b>P = .009</b>
SS Africa	83/252 (32.9%)	18/70 (25.7%)	P = .22
W Europe	6/252 (2.4%)	3/70 (4.3%)	P = .08



Logistic regression analysis with Ireland as reference category showed the model as a whole p = 0.005 (significant). By region, the only significant difference compared to Ireland was South America – being less likely to be measles immune (OR 5.3, 95% CI 1.5 – 18.8). Increasing age was associated with lower rate of non-immunity (OR 0.9 p<0.001 (Logistic regression))

Logistic regression analysis looking at MMR uptake in non-immune group shows no significant difference in uptake between different geographic origins, genders, age, mode of acquisition of HIV, or homelessness.

Regarding the Influenza vaccine, 230/327 received (70.3%), 97/327 did not receive (29.7%). Of those 38/77 who did not receive MMR, 19/38 (50%) received Influenza vaccine. Logistic regression analysis showed that the overall model showed a significant difference in flu vaccination rates depending on geographic origin. Compared to Ireland, patients from Sub-Saharan Africa were more likely to have received Influenza vaccine (OR 2.5, p .03, 95% CI 1.1 – 5.7), as well as patients from South America (OR 2.4, p .4, 95% CI 1.1 – 5.6). The differences between Ireland and other regions was not statistically significant.



## Conclusion

With increased global migration, the population of patients living with HIV infection in Ireland is expanding, predominantly with the transfer of care of those diagnosed with HIV infection abroad. In our cohort, measles immunity overall was 77.1%. When further characterised by geographical origin the only significant difference compared to Ireland was South America – being less likely to be measles immune.

Looking at MMR uptake in non-immune group shows no significant difference in uptake between different geographic origins, genders, age, mode of acquisition of HIV, or homelessness.

The main reason for those non-immune not receiving MMR is non-referral, contraindication and patient refusal. Targeted measures have been introduced to provide vaccination to those non-immune who have no contraindication to vaccine or have not declined receipt despite advice.

## References

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- Measles Measles - Health Protection Surveillance Centre. Available at: <https://www.hpsc.ie/a-z/vaccinepreventable/measles/> (Accessed: 09 May 2024).
- Measles (no date a) World Health Organization. Available at: [https://www.who.int/health-topics/measles#tab=tab\\_1](https://www.who.int/health-topics/measles#tab=tab_1) (Accessed: 09 May 2024).