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Examining the transnational preventive healthcare utilisation of a group of Eastern European migrants living full-time in another European state

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ABSTRACT

Migrants in Europe are shown to have consistently lower uptake of preventive healthcare compared to European host populations. This paper examines how the transnational preventive care use of Eastern European migrants in their country of origin may be associated with preventive care uptake in their European host country. Preventive care use data in Ireland was collected on 119 Polish migrants and 123 native Irish from June 2018 to September 2019. Preventive care use data was also collected on the Polish migrant group in Poland during the same period. Preventive care use was captured by examining general practitioner visits, blood or urine test uptake, and cancer screening uptake. Probit models were first estimated to examine whether the Polish migrants were more or less likely to have used each service in Ireland than the native Irish. Second, three bivariate probit models were estimated to examine the use of each service by the Polish migrants only in Ireland and Poland as the two dependant variables. The Polish migrants are less likely to have GP visits, blood or urine test uptake, and cancer screening uptake in Ireland compared to the native Irish. The Polish migrants from this study are also shown to potentially substitute blood or urine test uptake in Ireland for uptake in Poland. Transnational ties can determine the preventive care utilisation of migrants in Europe.

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1. Introduction

Migrants, in general, have different use and access to healthcare services when compared to the native population of their host country [1,2]. A very diverse spectrum of healthcare utilisation is observed across migrant groups within Europe compared to European host populations. There is evidence to suggest that migrants have a lower uptake of a range of healthcare services including preventive healthcare services [3,4]. In two systematic reviews, Norredam et al. [3] and Graetz et al. [4] both found that migrants in Europe have consistently exhibited lower uptake of preventive care services, including diagnostic tests and cancer screen-

ings when compared to European host populations as well as use of primary care specialist services [3,4].

A widely noted issue in the literature is the lack of reliable migrant health and healthcare utilisation data, which makes drawing meaningful conclusions on what factors underpin the noted disparities in healthcare utilisation between migrants and host populations difficult [5–7]. Nevertheless, it is important to determine why migrant groups may be reluctant to engage with preventive care in their host country. Previous studies have sought to examine the factors which underpin the differences in preventive care utilisation patterns of migrants and host populations. Migrants can face formal barriers (lack of entitlement to care, cost, co-payments) and informal barriers (lack of familiarity with the healthcare system, language difficulties) to accessing healthcare services in their host country, which can impede their use of preventive care [3,8].

While migrants can face challenges in accessing preventive care in their host country, migrants can use other means to access the care they require. Transnationalism is another factor that can underpin some of the notable differences in non-urgent healthcare use between migrants and host populations. Transnationalism sees migrant groups retain strong connections to their country of ori-

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gin through frequent visits. Migrants can use transnational ties to overcome the barriers to healthcare in their host country and to provide additional options to meet their health needs by travelling back to or remaining in close connection with their country of origin [9,10]. This frequent travel back to their country of origin can allow migrants to substitute their use of certain non-urgent healthcare services in their host country for use in their country of origin [11,12].

Examining migrant preventive care use in their host country only provides a potentially inconclusive snapshot of how migrants engage with preventive care. It is, where possible, beneficial to examine the preventive care use of migrants in their host country and their country of origin to get a more complete understanding of how migrants engage with such vital services. Failure to do so may result in an incomplete understanding of migrant health-related behaviours and premature policy implications. Knowing how migrants engage with preventive care in their host country and country of origin can allow for a more effective migrant health policy to be implemented.

This paper uses an exploratory analysis to examine how the transnational preventive healthcare use of migrants in their country of origin may be associated with preventive care uptake in their host country, by taking the case of Polish migrants residing full-time in Ireland. This paper will compare the preventive care use of a group of Polish migrants residing full-time in Ireland and a group of native Irish also residing full-time in Ireland. This paper will also examine the transnational preventive care use of the Polish migrant group in Poland to determine do the Polish migrants potentially substitute preventive care use in Ireland for use in Poland, which has not been done in the literature to the best of our knowledge. Polish migrants residing in another European state are shown to avail of transnational ties to Poland to access healthcare services [13–15]. However, little is known about how such migrants use transnational ties to Poland to access preventive care.

For this paper, preventive care use will be captured by examining three separate services, general practitioner (GP) visits, blood or urine test uptake, and cancer screening uptake. Understanding Polish migrant preventive care use in both Ireland and Poland offers a potentially new insight into the health-related behaviours of Ireland's largest migrant group. The results of this study will be of relevance to policymakers tasked with the design and implementation of migrant health policy in Ireland and elsewhere.

2. Overview of the Irish and Polish healthcare systems

2.1. The Irish healthcare system

Migrant health and healthcare accessibility are key policy objectives for the Irish healthcare system, which is detailed in the policy document, 'National Intercultural Health Strategy (NIHS) 2018–2023 for Ireland [16]. However, ensuring migrants do get access to healthcare in Ireland can be difficult. Healthcare in Ireland is somewhat unusual compared to most European nations, as Ireland does not provide universal access to healthcare services [17]. Accessing the Irish healthcare system can pose significant challenges to migrants not familiar with it. Ireland has a mixed tax-financed public healthcare system and a fee-based private healthcare system, resulting in a parallel system. Healthcare expenditure is funded in Ireland via 69% state funding, 15% out-of-pocket (OOP), 13% private health insurance and 2% from other voluntary sources [18].

Access to publicly funded healthcare services in Ireland is means-tested to distinguish between medical cardholders (entitled to free GP visits and hospital-based care), GP visit cardholders (entitled to free GP visits only), and the rest who must pay OOP through subsidised co-payments of care or through private health insurance [19]. Private health insurance is taken up by 43% of the

population, 30% have medical cards or GP visit cards, and the remainder have no insurance coverage. Those who have no coverage are still covered under the public healthcare system but must pay subsidised co-payments for care, subject to an annual cap though this does not include GP visits [17,20]. In Ireland, the vast majority of individuals access the healthcare system through the GP or A&E department, and GPs act as a gatekeeper to specialist care and diagnostic tests [21]. Anyone without a medical card or GP visit card must pay OOP for a GP consultation, which costs on average €53 [22]. Migrants with the legal right to live and work in Ireland are entitled to healthcare in Ireland, granted they access it through the access routes detailed above.

2.2. The Polish healthcare system

Compulsory health insurance covers 98% of the Polish population. Approximately 70% of health expenditure for the Polish healthcare system come from public funds. Poland has a large private healthcare system. Approximately 22% of healthcare expenditure is funded by OOP spending on private healthcare, which is one of the highest rates of OOP spending on private healthcare in the European Union (EU) [23]. The majority of individuals first access the Polish healthcare system through Basic Healthcare Units (BHU), where patients can receive a referral to obtain access to specialist healthcare [24]. GPs in Poland also act as gatekeepers to the public healthcare system. Access to publicly funded specialist outpatient services can be subject to long waiting times. Opting to go private and pay directly is the common solution to gain quicker access to private primary physicians, and diagnostic tests and services in Poland [23].

3. Methods

3.1. Healthcare utilisation survey

A paper-based survey was used for respondents to self-report their preventive care use. All surveys were completed in person by a trained interviewer with each respondent. Polish respondents were asked to report their preventive care use in Ireland and Poland during the past 12 or 24 months. Irish respondents were asked to report their preventive care use in Ireland only during the same period. In the past year, respondents were asked to report on their use of GP visits, whether they had a blood test and urine test. In the past two years, respondents were asked to report if they had any cancer screenings. Respondents also completed sociodemographic questions and self-reported health questions using the EQ-5D-5L generic health measure and the visual analogue scale (VAS).

3.2. Data collection

We use data collected on 242 respondents (including 119 Polish migrants and 123 native Irish). The primary data collection ran from June 2018 – September 2019. Ethical approval for the study was granted by NUI Galway's Research Ethics Committee (application number 18-Mar-13).

Polish migrants are the largest migrant group living in Ireland and make up 2.7% of the population in Ireland [25]. As such, Polish migrants were chosen for this research. Respondents were recruited into the study by using snowball sampling due to difficulties in obtaining large enough sample of Polish migrants. The Polish respondents were recruited into the study with the help of various Polish community organisations in Ireland, such as the Polish schools, and Polish community groups. The Irish respondents were primarily recruited via the interviewers' friends and family, and some staff and students at NUI Galway. All respondents received

a €10 shopping voucher for participating in the survey. Interviews were conducted in the respondent's home or another prearranged location. Troccoli et al. [26] also used a similar targeted snowball sampling strategy for hard-to-reach community groups when collecting transnational healthcare use data on Polish migrants living in the United Kingdom (UK). Respondents provided written consent to participate in the study.

3.3. Econometric methods

The first step in the analysis was to estimate three probit models to assess whether the Polish migrants were more or less likely to have had use of each preventive care service in Ireland compared to the native Irish. The first model examined GP visits. The second model examined an individual's uptake of blood or urine tests. The third model examined the uptake of any cancer screenings. We chose the three outcomes based on their likelihood of capturing preventive care use. While GP use is not necessarily a preventive healthcare service, it is where the majority of individuals in Ireland first encounter the Irish healthcare system, as noted above [21] and has an important role to play in both primary and secondary disease prevention. At the GP, individuals may receive advice on smoking cessation and diet, for example, as well as managing blood sugar in addition treatment or onward referral to specialist services. This outcome measure has been examined in other studies looking at preventive care use [27]. Blood tests and urine tests are commonly examined in preventive care studies [28,29] and cancer screening uptake is also a commonly studied outcome in preventive care studies [30,31].

Each dependant variable was coded as = 1 if an individual had used that particular service, and = 0 if not. Each model controlled for migrant/native status, age, gender, self-reported health (VAS), whether they had third-level education, whether they had private health insurance, employment status and marital status. The specification of all independent variables used in the analysis can be seen in Table 1. The specification of all the dependant variables (healthcare services) used in the analysis for Ireland and Poland can be seen in Table 2.

The second step in the analysis was to estimate three bivariate probit models on the Polish sample only. Bivariate probit models were used to examine the use of each preventive service by the

Polish migrants only in Ireland and Poland as the two dependant variables. The three models examined a Polish migrant's use of; GP visits in Ireland and Poland; blood or urine test uptake in Ireland and Poland; cancer screening uptake in Ireland and Poland. This step in the analysis was run to examine the Polish migrants' use of that particular preventive service in Ireland and Poland to determine was there a potential substitution effect in preventive care use present. Each bivariate probit model examined a Polish migrant's use of that particular preventive service in Ireland and Poland simultaneously. Each model in step two controlled for the same covariates as step one, and also controlled for the length of residence (LOR) (total years a Polish migrant has been resident in Ireland). This modelling approach accounts for the possible correlation amongst unobserved components of the two regression equations, thereby capturing the correlation between unobserved variables that may influence a Polish migrant's use of each preventive service in Ireland and Poland [32,33].

A bivariate probit model is used to accommodate the potentially correlated errors in the preventive care use in Ireland and Poland by Polish migrants living full-time in Ireland. It is possible that underlying latent characteristics that influence a Polish migrant's use of healthcare in Ireland could also potentially affect whether they had use of that same type of healthcare service in Poland. For example, a Polish migrant who is overly anxious about their health (the worried well) may be more likely to avail of a particular preventive service in both Ireland and Poland for reassurance. We would then expect to possibly find a positive correlation in the errors between the utilisation of that preventive service in Ireland and Poland. It is also possible that if the use of a particular preventive service in Poland acts as a potential substitute for a preventive service in Ireland, a negative correlation between the errors may be found to exist.

Under a bivariate probit model, it is possible to accommodate potential unobserved heterogeneity between a Polish migrant's preventive care utilisation in Ireland and Poland. In this case we can assume that for a particular preventive service in Ireland (for example, GP visits) is identified by a binary variable y_1^* and that same preventive service in Poland (GP visits) is represented by another binary variable y_2^* . In this case the first model becomes:

$$y_1^* = X_1' \beta_1 + \varepsilon_1 \text{ where } y_1 = 1 \text{ if } y_1^* > 0, 0 \text{ otherwise} \quad (1)$$

Table 1 Independent variables definitions and percentages/counts.

Variable	Definition	Percentage/count for Polish migrants	Percentage/count for native Irish
Polish migrant	1 if Polish migrant; 0 if Irish native	49.2%	50.8%
Age	1 if Age ≤ 36 (average age of sample); 0 otherwise	68.9%	33.3%
Age	Mean age in years (continuous)	38	34
Gender	1 if male; 0 if female	21.8%	55.3%
Self-reported health (VAS)	100 is the best possible health; 0 is the worst health imaginable (continuous)	83.7	85.2
Third-level education	1 if completed third-level education; 0 otherwise	75.6%	67.5%
Private health insurance	1 if has private health insurance; 0 otherwise	44.5%	56.1
Marital status	1 if married; 0 otherwise	68.9%	26.8%
Employment status	1 if employed; 0 otherwise	76.4%	53.6%
Length of residency (LOR) in Ireland in years (Polish only)	Length of time a Polish migrant has been living in Ireland in years (continuous)	11.6 (SD: 4.16)	-

Table 2 dependant variables definitions and percentage use in Ireland and Poland by migrant/native status.

Variable	Definition	In Ireland (Polish)	In Ireland (Irish)	In Poland (Polish only)
GP visits	1 if attended the GP; 0 otherwise	77%	80%	5%
Blood or urine test uptake	1 if a had a blood test or urine test; 0 otherwise	56%	57%	14%
Cancer screening uptake	1 if had any cancer screening; 0 otherwise	40%	36%	10%

The second model becomes:

$$y_2^* = X_1' \beta_2 + \varepsilon_2 \text{ where } y_2 = 1 \text{ if } y_2^* > 0, 0 \text{ otherwise} \quad (2)$$

In our case, the independent variables (x_1) in the two equations are the same. The error structure captures the potential correlation between utilisation of both preventive services (for example, GP use in Ireland and Poland), which following [34] can be described as:

$$\begin{pmatrix} \varepsilon_1 \\ \varepsilon_2 \end{pmatrix} | x_1 \sim N \left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix} \right] \quad (3)$$

Where ρ captures the correlation in the error terms between the utilisation of that particular preventive service in Ireland and Poland by the Polish migrants.

In a sensitivity analysis, we estimated three more probit models on the same preventive services (GP visits, blood or urine test uptake, and cancer screening uptake) on the Polish migrant sample only. The dependant variable for each model was whether a Polish migrant had used that particular preventive service in Ireland. Each model controlled for the same covariates as step two and controlled for a dummy indicator of whether a Polish migrant had used the same preventive service in Poland. In a sensitivity analysis, we also estimated the models with age specified as a continuous variable.

Table 3
Probit models (preventive care use in Ireland).

Variable	GP visits		Blood or urine test uptake		Cancer screening uptake	
	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Polish	-0.161***	0.06	-0.156**	0.07	-0.137**	0.67
Age	-0.091	0.07	0.028	0.08	0.042	0.07
Gender	-0.180***	0.06	-0.096	0.07	-0.267***	0.06
VAS	-0.005**	0.00	-0.004	0.00	0.000	0.00
Third level education	-0.170***	0.05	-0.162***	0.07	0.036	0.07
Private insurance	-0.074	0.05	-0.040	0.06	0.126**	0.06
Employed	0.046	0.05	0.144**	0.07	0.001	0.06
Married	0.186***	0.06	0.158**	0.08	0.165	0.08
Number of Observations	242		242		242	242

Estimates are presented as average marginal effects.

*** $p < 0.01$ ** $p < 0.05$ * $p < 0.1$.

Dependant variable = whether a respondent had use of each preventive care service in Ireland (full sample).

SE = standard error.

Table 4
Bivariate probit models (preventive care use in Ireland and Poland).

Variable	GP use in Ireland and Poland				Blood or urine test uptake in Ireland and Poland				Cancer screening uptake in Ireland and Poland			
	GP (Ireland)		GP (Poland)		BU (Ireland)		BU (Poland)		Cancer (Ireland)		Cancer (Poland)	
	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)	Coefficient	(SE)
Age	0.099	0.08	0.125***	0.04	0.037	0.11	0.092	0.08	-0.049	0.10	-0.136	0.09
Gender	-0.168	0.10	-0.057	0.06	-0.077	0.11	-0.133	0.09	-0.331***	0.08	-0.231***	0.04
VAS	-0.004	0.00	0.001	0.00	-0.002	0.00	0.000	0.00	0.002	0.00	0.001	0.00
Third level education	-0.108	0.09	-0.074	0.07	-0.156	0.10	-0.067	0.10	0.037	0.11	0.110*	0.07
Private insurance	-0.039	0.07	0.061	0.05	-0.043	0.09	0.186**	0.08	0.061	0.09	0.067	0.07
Employed	0.081	0.10	-0.050	0.07	0.220**	0.10	0.119	0.08	0.111	0.09	0.050	0.07
Married	0.111	0.10	0.082**	0.04	0.013	0.10	0.020	0.09	0.007	0.10	0.108*	0.06
LOR	0.011	0.01	-0.019***	0.01	0.017	0.01	-0.028***	0.01	0.018	0.01	-0.014	0.01
Rho (SE)	0.005				-0.530***				-0.110			
	(0.24)				(0.13)				(0.189)			
Number of Observations	119				119				119			

Estimates are presented as average marginal effects.

*** $p < 0.01$ ** $p < 0.05$ * $p < 0.1$.

dependant variable = whether a respondent had use of each preventive care service in Ireland or Poland (Polish sample only).

SE = standard error.

GP = general practitioner visits.

BU = Blood or urine test uptake.

Cancer = cancer screening uptake.

4. Results

Table 1 displays the percentages/count of respondents in each independent variable used in the analysis. Table 2 displays the percentages of respondents in each dependant variable used in the analysis for Ireland and Poland.

From step one of the analysis, the average marginal effects from the three probit models are presented in Table 3. A Polish migrant is 16 percentage points less likely to have had a GP visits in Ireland than an Irish native ($p < 0.01$). A Polish migrant is 16 percentage points less likely to have had a blood or urine test in Ireland than an Irish native ($p < 0.05$). A Polish migrant is 14 percentage points less likely to have had a cancer screening in Ireland than an Irish native ($p < 0.05$).

For step two of the analysis, three bivariate probit models were estimated on the Polish sample only on the same three preventive services from step one. The models examined a Polish migrant's preventive care use of that particular service in Ireland and Poland as the dependant variables. The three models examined a Polish migrant's use of; GP visits in Ireland and Poland; blood or urine test uptake in Ireland and Poland; cancer screening uptake in Ireland and Poland. The rho statistic (the correlation coefficient for the residuals of the two equations) from each of the three bivariate probit models are displayed in Table 4.

The rho statistic is negative and significant for a Polish migrant's blood or urine test uptake in Ireland and Poland ($p < 0.01$), signifying a strong negative correlation between the errors from the two regressions. The negative correlation suggests that where we overpredict blood or urine test uptake in Ireland, we underpredict blood or urine test uptake in Poland. This result suggests that unobserved factors that lead to a Polish migrant availing of blood or urine test uptake in Poland are associated with them being less likely to avail of blood or urine test uptake in Ireland. This finding may be seen as a potential substitution effect between blood or urine test uptake in Ireland for uptake in Poland. The rho statistics for the remaining two bivariate probit models (GP use in Ireland and Poland; cancer screening uptake in Ireland and Poland) are both insignificant. These findings demonstrate that the underlying factors which affect a Polish migrant's use of each of the two remaining services in Ireland and Poland are unrelated.

The average marginal effects of whether a Polish migrant had a GP visit, blood or urine test or cancer screening in Poland from the three bivariate probit models are displayed in Table 4. The longer a Polish migrant has lived in Ireland, they are less likely use a GP in Poland. If a Polish migrant has private health insurance, they are more likely to have had a blood or urine test in Poland than a Polish migrant who does not have private health insurance. The longer a Polish migrant has lived in Ireland, the less likely they are to have had a blood or urine test in Poland. The Polish migrant group from this study has an average length of residence in Ireland of 11.6 years (SD: 4.16) and are not considered recent migrants.

The average marginal effects from the Polish migrant utilisation of the three services in Ireland are displayed in Table 4 also. For brevity, the rest of the covariates are not discussed, but are described in the supplementary material.

In the sensitivity analysis, the results of which are displayed in Table 1A of the supplementary material, a Polish migrant who had a blood or urine test in Poland is 35 percentage points less likely to have had a blood or urine test in Ireland than a Polish migrant who did not have a blood or urine test in Poland ($p < 0.01$). The remaining two models produced no significant results. In the second sensitivity analysis, we ran the models again with age specified as a continuous variable and the results come out robust. These models can be seen in Tables 2A and 3A of the supplementary material.

The above results have presented marginal effects relating to the values in our study sample, and not the Polish migrant/native Irish community in Ireland. However, the results presented in this paper may be generalisable to the Polish migrant community residing in Ireland, but further research would be needed to assess that.

5. Discussion

This paper used an exploratory analysis to examine how the transnational preventive care use of migrants in their country of origin may be associated with preventive care uptake in their host country, by taking the case of Polish migrants residing full-time in Ireland. More specifically, this paper compared the preventive care utilisation of Polish migrants and native Irish across a range of three preventive services in Ireland (GP visits, blood or urine test uptake, and cancer screening uptake). A further analysis was run to examine the Polish migrants' use of those three same preventive services in Ireland and Poland simultaneously to determine was there a potential substitution effect in preventive care use present.

This analysis examined how Polish migrants and native Irish differ in their use of GP visits in Ireland. A Polish migrant is less likely to have had use of GP visits in Ireland than a native Irish, *ceteris paribus*. This result does somewhat follow the evidence from the literature on the utilisation of GP visits by migrants. Various studies have also found that migrants have lower use of GP visits

than host populations [35–37]. Some reasons migrants have lower use of GP visits include barriers to healthcare, migrants may not be registered with a GP in the host country and cultural differences. However, due to the heterogeneous nature of migrants in general, other studies have found that migrants also have greater use of GP visits than host populations [38,39]. As such, it is hard to draw a conclusive understanding as to whether migrants have greater or less use of GPs in their host country compared to host populations.

In this study, a Polish migrant is shown to be less likely to have had a blood or urine test and less likely to have had a cancer screening in Ireland than a native Irish respondent, *ceteris paribus*. These results follow the evidence from the literature that does show that migrants have lower utilisation of various types of diagnostic tests consistently [3,4] and lower uptake of any cancer screenings consistently [40,41] than host populations. Understanding what causes such differences has been linked to differences in rates of time preference (future discount rate) and health preferences (how one values health) between migrants and host populations [42,43]. The barriers to healthcare faced by migrants are also noted to be a reason for the lower use of blood or urine tests and cancer screening uptake by migrants [3]. The Polish migrants from this study may be less likely to avail of blood or urine tests and cancer screening uptake in Ireland due to them being less likely to attend the GP where such diagnostic tests can be conducted or a referral is given to further care and diagnostic tests.

A further analysis used bivariate probit models to examine; a Polish migrant's use of GP visits in Ireland and Poland; a Polish migrant's blood or urine test uptake in Ireland and Poland; a Polish migrant's cancer screening uptake in Ireland and Poland. This analysis was run to see whether a potential substitution effect was present in the use of these three services in Ireland for use in Poland by the Polish migrants. There is a strong negative correlation between the errors from the two regressions for a Polish migrant's use of blood or urine tests in Ireland and Poland. This finding may suggest a potential substitution effect is present in a Polish migrant's uptake of blood or urine tests in Ireland for uptake in Poland. This result is also echoed in the sensitivity analysis presented in Table 1A of the supplementary material. It shows that a Polish migrant who had a blood or urine test in Poland is 35 percentage points less likely to have had a blood or urine test in Ireland than a Polish migrant who did not have a blood or urine test in Poland, *ceteris paribus*. Therefore, a Polish migrant's use of blood or urine tests in Poland is negatively associated with their use of similar services in Ireland, which may demonstrate a potential substitution effect.

This substitution effect may be a result of many unobserved factors, such as; the Polish migrants may wish to bypass the gatekeeper function of GPs for diagnostic tests in Ireland, which they can do by paying OOP or using private health insurance and going private in Poland for quicker access to care, as noted above. Since whether a Polish migrant has private health insurance is a significant determinant of their uptake of blood or urine tests in Poland, this may suggest that the Polish migrants may see accessing the Polish private healthcare systems as a preferred route to availing of blood or urine tests. The Polish migrants may perceive the quality of healthcare better and cheaper in Poland than in Ireland, hence this may increase their preventive care use in Poland. Various barriers to healthcare may reduce a Polish migrant's use of preventive care in Ireland and increase their use in Poland. The Polish migrants from this study may prefer to use healthcare in Poland as they may be more familiar with the healthcare system in Poland than in Ireland, and they can communicate with healthcare professionals in Polish. Transnational preventive care utilisation may be a preferred accessed route for non-urgent care by the Polish migrants given the availability of regular and cheap flights between Ireland and Poland (pre-Covid-19).

There was no significant correlation between the errors from the two regressions from the two remaining bivariate probit models. From this study, an important determinant of a Polish migrant's use of blood or urine tests and GP use in Poland is how long they have been resident in Ireland. The longer a Polish migrant is a resident in Ireland, they are less likely to have had a blood or urine test, or had GP use in Poland. This finding may suggest that the longer a Polish migrant lives in Ireland and becomes more familiar with the Irish healthcare system, the less need they have to return to Poland to access preventive care. This finding may also represent that as the Polish migrants assimilate into Irish society, they may also return to Poland less and have less opportunity to avail of preventive care in Poland.

Similar findings were noted by Broek [13] who found that the longer a Polish migrant lives in the Netherlands the less likely they are to visit a doctor in Poland. The author suggests this finding is underpinned by Polish migrants with a longer duration of residency in the Netherlands having greater Dutch language proficiency compared to recently arrived Polish migrants. Polish migrants in London have also been observed to avail of transnational healthcare access in Poland, as found by Osipovič [14]. The author found that Polish migrants returned to Poland to use healthcare as they perceived the care in Poland to be faster and more efficient than care received in London. The Polish migrants were also in favour of returning to Poland to avail of care as the care they received was in a "culturally familiar environment". Polish migrants in Europe are found to face a range of barriers when trying to access healthcare in an European host country [15]. Polish migrants can use transnational ties to Poland to overcome such barriers to healthcare access.

We acknowledge several limitations of this study. Our sample size was limited, and as such, we were limited in the analysis we could conduct, which is common when using data on migrant health and healthcare utilisation [44]. We did not use a random sample, and as such, the samples collected may not be representative of either the Polish migrant group in Ireland or the native Irish population. Given our small sample size, Polish migrants and native Irish samples varied across sociodemographic characteristics, and the samples were not balanced. The healthcare utilisation data collected was a self-reported account of service use by each survey respondent and may not be fully accurate. Our econometric analysis was constrained given our limited sample size, and we had to use binary choice models where count models may have been more informative. It is worth noting that this research took place pre-Covid-19. Polish migrants or migrants in general who availed of transnational healthcare utilisation pre-Covid-19 may have been and may continue to be adversely affected by the international travel restrictions imposed in Ireland and elsewhere. Where possible, more healthcare utilisation data is needed and should be collected in migrants' European host countries and countries of origin to gain a better understanding of migrant transnational health-related behaviours. It is an area where more research is required in Ireland and elsewhere.

While the results from this study show that the Polish migrants may use transnational ties to substitute blood or urine test uptake in Ireland for uptake in Poland. The Polish migrants from this study do not appear to use similar transnational ties to substitute use of GP visits or cancer screening uptake in Ireland for use of these services in Poland. Since the Polish migrant group have lower use of those two services in Ireland compared to the native Irish group and do not appear to substitute use of these same services in Poland, this may show they have under-utilisation of these services in general. If we only examined a Polish migrant's preventive care utilisation in Ireland compared to a native Irish respondent, our results and policy implications may have been misleading. Our results and policy implications would have suggested that greater

effort should be made to increase demand-side factors associated with some preventive care uptake by Polish migrants in Ireland. However, we could capture the Polish migrants' use of preventive care in Poland. Since we can see that the Polish migrants from this study may substitute some preventive care use in Ireland for care in Poland, changes in policy in Ireland may yield little change in this behaviour by the Polish migrants who may see this transnational access route to some preventive care in Poland as preferable to accessing similar care in Ireland. Therefore, the Polish migrants then may be exhibiting a preference for accessing some preventive care in Poland over similar care in Ireland. This behaviour by the Polish migrants from this study does, however, seem to change with the length of time lived in Ireland.

6. Conclusion

The Polish migrants in this study are shown to be less likely to have GP visits, blood or urine test uptake, and cancer screening uptake in Ireland compared to the native Irish. Policymakers in Ireland may find this valuable information in understanding where disparities exist in the preventive care use between Polish migrants and the resident Irish population. Policymakers in Ireland may also wish to note that since Polish migrants in Ireland may substitute some preventive care (blood or urine tests) in Ireland for care in Poland, any policy objective that looks to increase such preventive care uptake in Ireland by Polish migrants may be deemed ineffective if Polish migrants do not see the benefit in accessing such care in Ireland when they may have a preference to do so in Poland. Transnational ties can determine the health, health-related behaviours and healthcare utilisation of migrants residing in European host countries. The results from this study can be used to further inform policymakers in Ireland and Europe on the role transnationalism has on migrant preventive care use in European host countries.

Authors' contributions

Each author fully, fairly and equally contributed to the research and drafting of this manuscript.

Dan Kelleher: data curation, data analysis, writing original draft and redrafting of the manuscript. Edel Doherty: redrafting of the manuscript and data analysis. Ciaran O'Neill: redrafting of the manuscript and data analysis.

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None of the authors have any conflicting interests, monetary or otherwise that would in any way inhibit the submission and publication of this research.

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