DOI: 10.1111/hel.12372

REVIEW ARTICLE

WILEY Helicobacter

Contemporary migration patterns in the prevalence of *Helicobacter pylori* infection: A systematic review

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Funding information
This work was supported by "Fundo Europeu de Desenvolvimento Regional" (FEDER) funds through the "Programa Operacional Factores de Competitividade" (POFC) – COMPETE (FCOMP-01-0124-FEDER-021181) and by national funds through the "Fundação para a Ciência e a Tecnologia" (PTDC/SAU-EPI/122460/2010) and the Epidemiology Research Unit – Institute of Public Health, University of Porto supported by the "Fundação para a Ciência e a Tecnologia" (UID/DTP/047507/2013). Individual grants attributed to SM (SFRH/BD/102585/2014), ARC (SFRH/BD/102181/2014), AF (PD/BD/105823/2014), and BP (SFRH/BPD/75918/2011 and SFRH/BPD/108751/2015) were supported by "Fundação para a Ciência e a Tecnologia." The funders had no role in study design, data collection, decision to publish, or preparation of the manuscript.

Abstract

Background: A rapid growth in the number of international migrants over the past years has occurred with most traveling to more affluent settings. As *Helicobacter pylori* infects over half of the adult population and its prevalence is higher in developing countries, understanding the prevalence of infection in migrants can provide insight into future trends in the burden and management of infection. We aimed to describe the prevalence of *H. pylori* among migrants through a systematic literature review.

Methods: We searched PubMed® from inception to September 2015 to identify studies reporting the prevalence of *H. pylori* in international migrants according to country of birth for first-generation, and country of birth and parents' nationality for successive generations. Comparable data from origin and destination populations were obtained from the same studies or, when not present, from a previous systematic review on *H. pylori* worldwide.

Results: A total of 28 eligible studies were identified with data for 29 origin and 12 destination countries. Two studies that evaluated refugees presented prevalences of infection higher than both the origin and destination countries. Otherwise, the prevalences among migrants were generally similar or below that of the origin and higher than the destination. Second- or more generation had lower prevalences compared to first-generation migrants.

Conclusions: Our study findings are consistent with what would be expected based on the prevalence of *H. pylori* worldwide. The results of this review show that migrants are particularly at risk of infection and help to identify gaps in the knowledge of migrants' prevalence of infection globally.

KEYWORDS

Helicobacter pylori, migrants, prevalence, refugees, systematic review

1 | INTRODUCTION

The changing political and economic landscape worldwide has led to a rapid growth in the number of international migrants over the past 15 years, increasing from 173 million in 2000 to 244 million in 2015.[1] Health outcomes among migrants are influenced by a variety of factors including country of origin and destination, social and economic circumstances, and access to health care in the destination country.[2,3]

Globally, *Helicobacter pylori* infection affects more than half of the adult population[4] and was estimated to have accounted for over 75% of all gastric cancer cases in 2012,[5] despite the fact that its prevalence has been declining in the last few decades.[6] Improvements in socioeconomic and educational levels, namely regarding sanitation and general living conditions, have been associated with this decrease, which also had an effect on gastric cancer trends, though with significant differences across geographic regions.[7]

As the prevalence of infection remains generally higher in less developed or developing regions than in developed countries,[8] and most migrants travel to more affluent settings,[1] understanding the prevalence of *H. pylori* in these populations can provide insight into future trends in the burden and management of the infection, and may help to identify subpopulations most likely to benefit from interventions.[9]

Therefore, we aimed to describe the prevalence of *H. pylori* infection among migrants, taking into account the country of origin and destination, through a systematic review of published studies. We also examined how the prevalence of *H. pylori* among migrants changes over generations and with the duration of residence in the origin or destination country.

2 | METHODS

A study protocol was predefined by the authors and followed throughout the review.

2.1 | Search strategy

PubMed® was searched from inception to September 2015, to identify published papers reporting *H. pylori* prevalence. The search expression is provided in the systematic review flowchart shown in Figure 1. The list of bibliographic references of the original reports considered eligible for the systematic review and relevant review articles were also screened.

2.2 | Selection of studies

The list of references retrieved were screened independently by two of three reviewers (AF, ARC and SM), following predefined criteria, to determine the eligibility of each report. Studies including all types of international migrants (e.g., migrant workers, forced migrants, irregular migrants, or those with the reason for migration not specified[10]) described according to country of birth for first-generation migrants, and according to country of birth and parents' nationality for second- or more generation migrants were considered.

The criteria for exclusion of studies were the following: (1) papers not written in English, Portuguese, Spanish, French, Italian, Polish, (2) research not involving humans (e.g., in vitro or animal research), (3) noneligible publication types (reviews, editorials, comments, guidelines, case reports), (4) studies specifically evaluating samples that do not allow inference for the general population (e.g., subjects undergoing endoscopy for purposes other than screening), (5) studies including only *H. pylori* infected subjects (e.g., *H. pylori* eradication trials), (6) studies with data not related to *H. pylori* prevalence or addressing other outcomes (e.g., cost-effectiveness analyses), (7) studies with a nonsystematic assessment of *H. pylori* infection in biological samples (e.g., self-reported information, secondary data on infection status retrieved from laboratory databases) and (8) studies evaluating samples with no migrants or not providing the prevalence of *H. pylori* infection in first-, second- or more generations of migrants, specifically.

When more than one report referred to the same study, the one presenting the results with more detail (e.g., regarding the prevalence according to age, country of origin and destination, including region, or according to different generations), or providing data for the largest sample was chosen; for cohort studies involving children, specifically, the longest follow-up was considered. Nevertheless, any of the reports could be used to obtain information on the study characteristics.

The decisions taken independently by the reviewers in each step were compared, and discrepancies were resolved by consensus or after discussion with a third researcher (BP).

2.3 | Data extraction

Two investigators (ARC and SM) evaluated independently the selected studies to extract data regarding: the year of publication and period of data collection (when no period of data collection was available, we assumed the publication year minus the median difference between the publication year and the midpoint of years of data collection in the studies for which that information was available [4.5 years]), country and region where the study was conducted, sampling procedures, sample characteristics (age distribution, generation, reason for and time since migration, country of origin and destination, and definition of comparison groups), and methods used to determine *H. pylori* infection status.

The prevalence of *H. pylori* in different generations of migrants (age-specific data were preferred, when available) and comparable age-specific data for origin and destination populations were retrieved. The latter were obtained from the same papers as the migrants or, when not present, from reports included in a previous systematic review on the prevalence of *H. pylori* worldwide[6] and according to the following criteria: (1) used the same type of assessment (past versus active infection[11]), (2) was conducted within at least 10 years of the migrants study and (3) presented age-specific estimates of infection comparable to the migrants. If more than one comparable study was available, we chose the one that, in order of preference: (1) evaluated nationally representative or general population samples, (2) had the year closest to data collection of the migrants study and (3) had the largest sample size. When necessary, the authors of this review calculated the prevalence of *H. pylori*, for specific age groups, using data provided in the original reports.

Differences in the data extracted by the two investigators were discussed until consensus and involving a third researcher (BP), whenever necessary.

2.4 | Data analysis

Patterns of migration and the prevalence of *H. pylori* infection in first-generation adult migrants and refugees, in comparison with that observed in the country of origin and destination, were depicted in a map using the spatial reference GCS_WGS_1984 and the ArcGIS™ ArcMap 10.3 software. If more than one paper provided the same geographic pattern (same origin and destination countries), the one

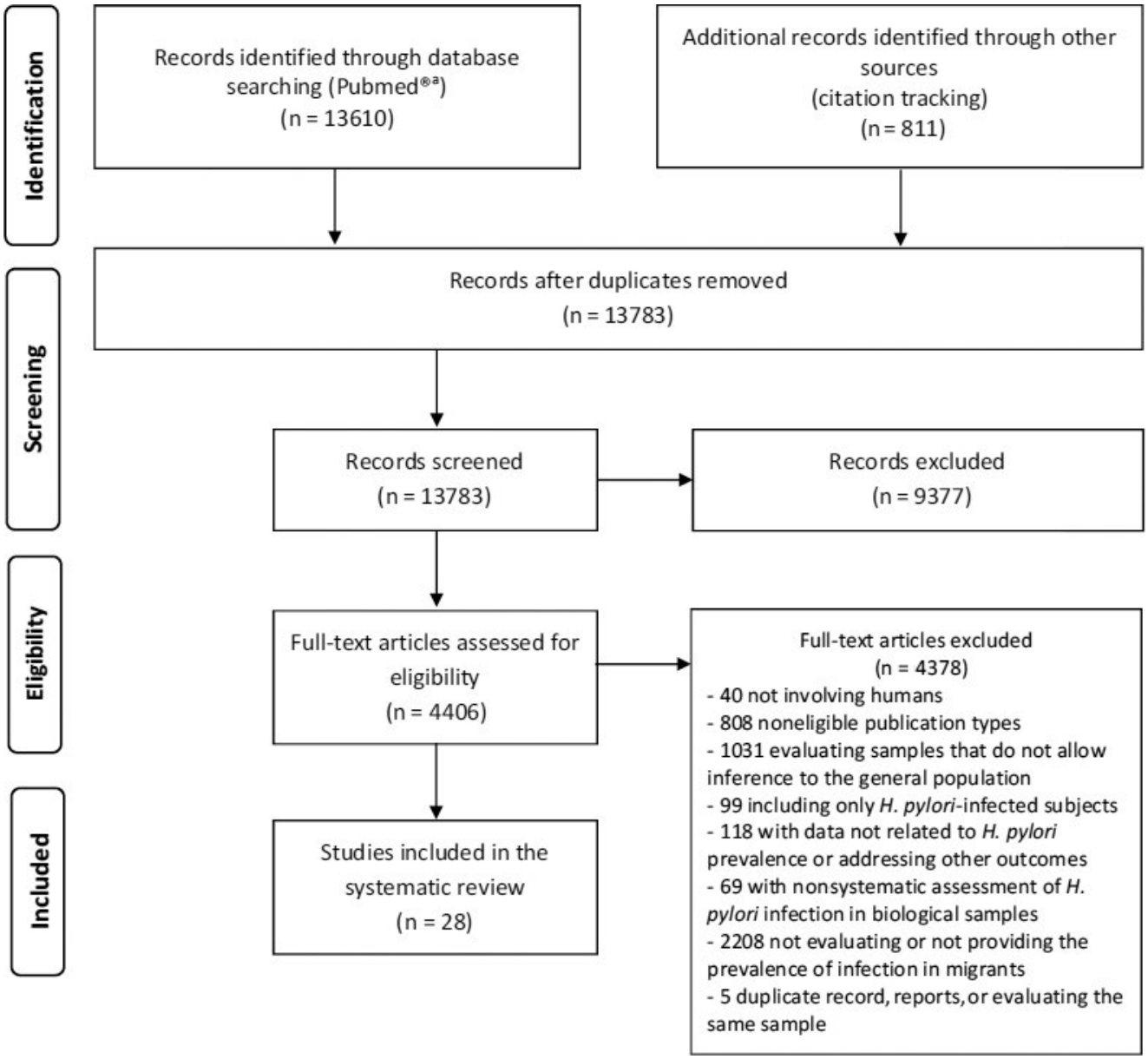

FIGURE 1 Systematic review flowchart. [a]Search expression (from inception to September 2015): (*Helicobacter pylori* OR campylobacter pylori) AND (incidence OR prevalence OR "risk factors" OR determinants OR (lifestyle OR lifestyles) OR (tobacco OR smoking OR cigarette OR smoke) OR ("dietary pattern" OR "dietary patterns" OR "eating pattern" OR "eating patterns" OR "food pattern" OR "food patterns") OR (diet OR fruits OR vegetables OR antioxidants) OR (alcohol OR drinking) OR (salt OR salted OR nacl OR "sodium chloride" OR sodium OR "processed meat" OR "salt preserved foods" OR "smoked food") OR coffee OR tea OR (obes* OR "body mass index" OR bmi OR overweight) OR (diabetes OR glycemia OR hyperglycemia OR "impaired fasting glucose" OR IFG OR "impaired glucose tolerance") OR (crowding OR overcrowding) OR ("socioeconomic status" OR "socioeconomic level" OR ses OR "blood type" OR "blood group" OR "lewis antigen")) NOT (animals[mh] NOT humans[mh])

with the largest sample of migrants was selected for depiction on the map. Origin and destination countries for which no age-specific prevalence of *H. pylori* infection could be found were not included on the map.

Results were summarized in tables showing the prevalence of infection in migrants, and in the country of origin and destination, and in figures representing the prevalence of infection according to generation and time residing in the origin or destination country.

3 | RESULTS

We identified 28 studies addressing the prevalence of *H. pylori* infection in migrants[12-39] from 29 origin (15 from Africa, three from the Americas, six from Asia and five from Europe) and 12 destination (three from the Americas, four from Asia and Oceania, and five from Europe) countries. The reports were published between 1988 and 2014, and those providing a period of data collection refer to 1989

and 2012. Most studies had a cross-sectional design and used serologic tests to detect *H. pylori* infection status.

Regarding the reasons for migration, two included refugees,[21,29] one was on Irish soldiers assigned to a mission in Lebanon (LBN),[14] one was on children internationally adopted in the United States of America (USA)[30] and the remaining were migrants with reason for migration not specified. The studies covered a wide age range, between <1 and 90 years, with sample sizes ranging from 13 to 1859 migrants. Six studies included children only and 19 focused on adults only. Regarding the latter, two included males only (refugee monks[29] and soldiers[14]) and five evaluated females only (female immigrants from Viet Nam [VNM][12] and pregnant women or mothers[13,19,23,24]). Seventeen studies had first-generation migrants only,[12,14-18,21,24-26,29,30,33-36,38] six included first- and second- or more generations[13,19,23,27,32,37], and the others were on second- or more generations alone.[20,22,28,31,39] First-generation migrants had a migration time ranging between 1 day and 39 years. A detailed description of included studies is presented in Table S1.

The nationally representative prevalences of *H. pylori*[6] in the countries of origin and destination are shown in Figure 2, with lines representing the difference in the prevalence of infection in migrants in relation to origin and destination countries. The prevalence of *H. pylori* among first-generation migrants was higher than the host population in most instances. Compared to the origin, the prevalence was higher in migrants from the African continent traveling to Europe, similar in those going from Asia to the Americas and lower in those migrating within the same continent (the Americas, Asia and Oceania, and Europe). The refugees moving from China (CHN) to India (IND) presented a prevalence of infection higher than both origin and destination countries (77.2%).[29] The studies with smaller sample sizes, not depicted in the map, showed similar patterns for the prevalence of infection between migrants, and the origin and destination countries (Table 1).

The prevalence of *H. pylori* infection among migrants, and in origin and destination countries is shown in Table 1. In studies for which no comparison for the country of origin could be found (not depicted in Figure 2), the prevalence of infection among migrants ranged between 42.9% (refugees from El Salvador [SLV] to Australia [AUS])[21] and 100% (Gambia [GMB], Guinea [GIN], and Guinea Bissau [GNB] to Spain [ESP])[36]; being higher than the observed in the destination. The study

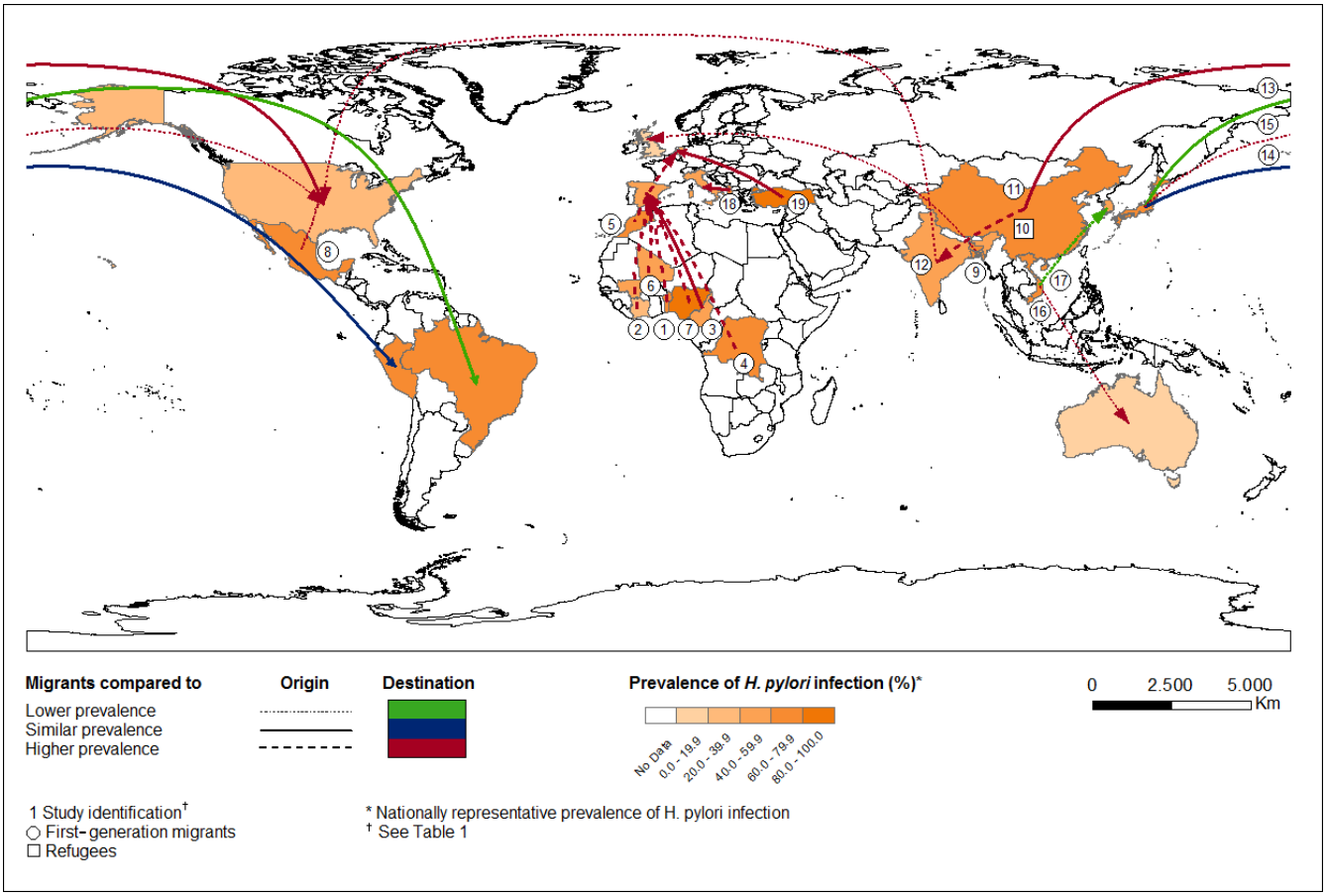

FIGURE 2 Migration patterns and prevalence of *H. pylori* in migrants, origin, and destination countries in adult first-generation migrants and refugees[a]. [a]The prevalence of infection in migrants was defined as similar, higher, or lower than origin and destination populations when the difference was greater than ±10% with lines created to connect the geographic center of each country of origin and destination, and an arrow was added to the destination country. Migrants from Cabo Verde (CPV), El Salvador (SLV), Ethiopia (ETH), Gambia (GMB), Ghana (GHA), Guinea (GIN), Guinea Bissau (GNB), Sierra Leone (SLE), and Suriname (SUR) were not included in the map as no comparable prevalence of *H. pylori* infection in the origin country was available

TABLE 1 Summary results of the prevalence of *H. pylori* infection (%) among migrants, origin, and destination countries

			Prevalence of *H. pylori* infection (%)		
Origin continent	Origin→destination	Study identification[a]	Migrants[b]	Origin[c]	Destination[c]
Africa	BEN→ESP	①	100.0[36]	75.9[51]	34.0[52]
	CIV→ESP	②	100.0[36]	40.6[53]	34.0[52]
	CMR→ESP	③	85.7[36]	80.8[54]	34.0[52]
	COD→ESP	④	100.0[36]	62.4[55]	34.0[52]
	CPV→NLD		88.0[d19]	NA	24.0[d19]
			2G=36.6[d19]	NA	24.0[d19]
			≥2G=27.9[20]	NA	5.7[20]
	ETH→AUS		43.0[21]	NA	9.8[21]
	GMB→ESP		100.0[36]	NA	34.0[52]
	GHA→ESP		91.7[36]	NA	34.0[52]
	GHA→NLD		≥2G=25.0[31]	NA	0.5[31]
	GIN→ESP		100.0[36]	NA	34.0[52]
	GNB→ESP		100.0[36]	NA	34.0[52]
	MAR→NLD		≥2G=6.0[31]	NA	0.5[31]
		⑤	85.7[d19]	72.7[56]	24.0[d19]
			2G=87.8[d19]	72.7[56]	24.0[d19]
			≥2G=27.0[20]	NA	5.7[20]
	MLI→ESP	⑥	100.0[36]	44.0[57]	34.0[52]
	NGA→ESP	⑦	89.7[36]	13.6[58]	34.0[52]
	SLE→ESP		96.3[36]	NA	34.0[52]
	SOM→NLD		≥2G=66.0[31]	NA	0.5[31]
Americas	MEX→USA	⑧	69.0[16]	81.3[59]	44.2[16]
			74.7[17]	73.7[60]	29.4[17]
			≥2G=53.4[e22]	81.3[59]	32.7[e22]
			62.1[23]	74.5[59]	25.4[f61]
			≥2G=40.7[23]	74.5[59]	25.4[f61]
			65.0[24]	74.0[24]	25.4[f61]
			33.3[25]	NA	20.7[25]
			22.6[35]	38.4[59]	7.1[f62]
	SLV→AUS		40.0[21]	NA	15.6[21]
	SUR→NLD		≥2G=2.0[31]	NA	0.5[31]
			60.4[d19]	NA	24.0[d19]
			2G=52.9[d19]	NA	24.0[d19]
			≥2G=10.4[20]	NA	5.7[20]
Asia	BGD→GBR	⑨	66.0[13]	83.4[63]	24.7[64]
			2G=81.0[13]	81.6[63]	22.9[64]
	CHN→IND	⑩	77.2[29]	61.5[65]	44.0[66]
	CHN→USA		60.0[26]	62.3[65]	24.0[26]
			16.0[30]	27.0[67]	22.5[17]
			81.4[33]	56.4[67]	32.0[e68]
		⑪	63.4[33]	56.4[67]	32.0[e68]
			59.4[33]	56.4[67]	32.0[e68]
	IND→NLD		≥2G=50.0[31]	21.1[69]	0.5[31]
	IND→USA		38.5[15]	78.0[70]	0.0[15]
		⑫	46.1[25]	83.3[71]	20.7[25]

(Continues)

TABLE 1 (Continued)

Origin continent	Origin→destination	Study identification[a]	Prevalence of *H. pylori* infection (%)		
			Migrants[b]	Origin[c]	Destination[c]
	JPN→BRA	⑬	52.6[27]	47.3[72]	90.5[73]
			2G=48.2[27]	43.1[72]	88.5[73]
Asia			3G=42.7[27]	43.1[72]	88.5[73]
			≥2G=9.3[28]	11.9[74]	12.1[75]
			83.3[37]	68.0[76]	88.0[73]
			2G=75.0[37]	68.0[76]	88.0[73]
	JPN→PER	⑭	71.4[37]	74.4[76]	75.0[77]
			2G=74.2[37]	74.4[76]	75.0[77]
			3G=78.6[37]	74.4[76]	75.0[77]
	JPN→USA	⑮	50.0[32]	70.0[78]	32.7[e22]
			≥2G=25.0[32]	70.0[78]	32.7[e22]
	RUS→USA		49.0[30]	50.6[79]	22.5[17]
	VNM→AUS	⑯	68.4[18]	79.2[80]	37.0[81]
			18.4[21]	NA	15.6[21]
	VNM→KOR	⑰	55.7[12]	76.4[80]	71.4[12]
Europe	ALB→ITA	⑱	78.7[38]	70.6[82]	51.9[83]
	DEU→NLD		≥2G=6.0[31]	NA	0.5[31]
	IRL→LBN		31.5 (before)[14]	43.0[84]	NA
			28.5 (after)[14]	43.0[84]	NA
	ROU→USA		20.0[30]	NA	22.5[17]
	TUR→DEU		≥2G=30.4[e34]	44.5[e34]	13.1[e34]
			≥2G=22.2[39]	25.6[85]	2.3[39]
	TUR→NLD	⑲	83.7[d19]	74.8[86]	24.0[d19]
			2G=74.0[d19]	74.8[86]	24.0[d19]
			≥2G=13.9[20]	28.2[87]	5.6[20]
			≥2G=6.0[31]	33.3[88]	0.5[31]

[a]○, □ Study identification of first-generation migrants and refugees, respectively, represented in Figure 3.
[b]First-generation unless otherwise stated (e.g., 2G refers to second-generation migrants).
[c]The comparable prevalences of *H. pylori* infection were retrieved according to specific age groups. To characterize each strata regarding age of the participants, the median or the mean age of participants in each age group was used, whenever available. Alternatively, we assumed the midpoint of the age interval. For the open age intervals at the extremes, we estimated the midpoint by adding and subtracting the width of the closest class to the upper and to the lower limits, respectively (e.g., for studies reporting data in participants aged <30, 30-39, 40-49, and ≥50, 20, and 59 were the midpoints assigned to the lowest and highest age groups, respectively).
[d]Additional information received directly from the first author (May 19, 2016).
[e]Age-adjusted prevalence of *H. pylori* infection.
[f]Weighted percent prevalence.
→ From origin country to destination country.
ALB, Albania; AUS, Australia; BEN, Benin; BGD, Bangladesh; BRA, Brazil; CHN, China; CIV, Côte d'Ivoire; CMR, Cameroon; COD, Democratic Republic of the Congo; CPV, Cabo Verde; DEU, Germany; ESP, Spain; ETH, Ethiopia; GBR, United Kingdom of Great Britain and Northern Ireland; GHA, Ghana; GIN, Guinea; GMB, Gambia; GNB, Guinea Bissau; IND, India; IRL, Ireland; ITA, Italy; JPN, Japan; KOR, Republic of Korea; LBN, Lebanon; MAR, Morocco; MEX, Mexico; MLI, Mali; NA, Not Available; NGA, Nigeria; NLD, Netherlands; PER, Peru; ROU, Romania; RUS, Russian Federation; SLE, Sierra Leone; SLV, El Salvador; SOM, Somalia; SUR, Suriname; TUR, Turkey; USA, United States of America; VNM, Viet Nam.

which included Irish soldiers assigned to a mission in LBN showed a lower prevalence of infection in this specific group when compared to the origin country and no significant changes, 31.5% and 28.5%, one month before service abroad and within 3 months after a 6-month mission, respectively.[14] Finally, the children adopted in the USA from CHN and Romania (ROU) had prevalences of infection similar than the destination, whereas those from the Russian Federation (RUS) had a higher prevalence of infection when compared to the USA.[30]

Generation-specific prevalences of infection in migrants from studies which included first- and second- or more generations are shown in Figure 3. The prevalence of *H. pylori* among the latter was lower than the first-generation migrants in all, except in Japanese

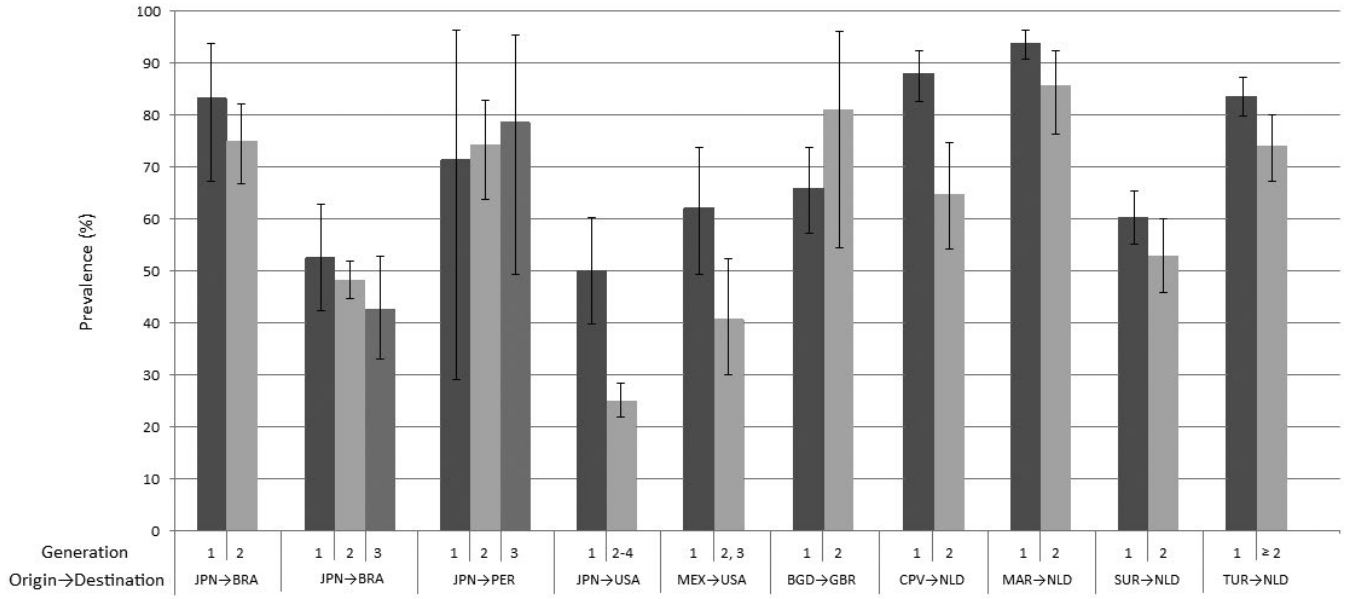

FIGURE 3 Prevalence and corresponding 95% confidence intervals[a] of *H. pylori* infection in first-, second- or more generation migrants. [a] 95% confidence intervals calculated by the authors of the present review using data provided in the original reports. →, From origin country to destination country. BGD, Bangladesh; BRA, Brazil; CPV, Cabo Verde; GBR, United Kingdom of Great Britain and Northern Ireland; JPN, Japan; MAR, Morocco; NLD, Netherlands; PER, Peru; SUR, Suriname; TUR, Turkey; USA, United States of America

migrants residing in Peru (PER)[37] and Bangladeshi women in the United Kingdom of Great Britain and Northern Ireland (GBR).[13] Additionally, in most instances, the prevalence of infection in second- or more generation migrants remained higher than the observed in the destination although it was generally lower than that of the origin country (Table 1).

With respect to the association between *H. pylori* infection and the number of years residing in the origin and destination country (Figure 4), we can observe that residing in the destination country for a longer period of time is inversely associated with *H. pylori* infection (East Asia to the USA).[33] Those migrating later in life and those with a greater number of years in the origin generally have a higher prevalence of infection, although this trend was not statistically significant (Bangladesh [BGD] to GBR,[13] and JPN[32] and Mexico [MEX][35] to the USA).

4 | DISCUSSION

The prevalence of infection in first-generation migrants was generally higher than that of the destination country, while compared to the country of birth, it varied according to the continent of origin. Additionally, the prevalence of infection decreased with successive generations, although it remained higher than that of the destination in most instances.

Generally, migrants tend to be healthier than both the general population from the destination and origin country, a phenomenon known as the "healthy migrant effect,"[40] due to the fact that healthier individuals may be more likely to migrate, destination countries may have selective migrant criteria thus favoring healthier people, and the less healthy individuals may return to their home country (also known as the "salmon bias effect"[41]). Moreover, migrants generally have lower socioeconomic status, fewer social supports, language barriers, and occasionally face discrimination in their new environments.[1,2] Infection by *H. pylori* is more common in less developed countries and is associated with low socioeconomic status and crowded conditions.[42] We found that migrants tended to travel to countries with a lower prevalence of infection than that of their own and they generally had a similar or lower prevalence of infection, compared to the population observed in the origin country.

Over time, differences in health between migrants and the destination's population attenuate, which may be attributed to acculturation – broadly described as the process by which individuals adopt the attitudes, values, customs, beliefs, and behaviors of another culture;[43] that is, the prevalence of *H. pylori* infection in migrants appears to decrease with each successive generation born in the destination country, particularly when the origin country is of high prevalence, such as JPN (75%) and MEX (66%).[6] A cross-sectional study of Japanese migrants in the USA showed that a majority of those residing in the USA adopted a Western diet,[44] which may have contributed to the decrease observed in the prevalence of *H. pylori* infection in successive generations.[33] However, the prevalence of infection continued to be higher than the host population, which may be explained by *H. pylori* infection frequently being acquired in childhood, and being associated with low socioeconomic status, household crowding and having infected family members.[42,45,46]

Relatively few studies presented the prevalence of *H. pylori* in first-generation migrants by duration of residence (or age at arrival) in the host country, which could have allowed for the assessment of acculturation. In these studies, we could observe that those living in the country of destination for a longer period of time had a lower

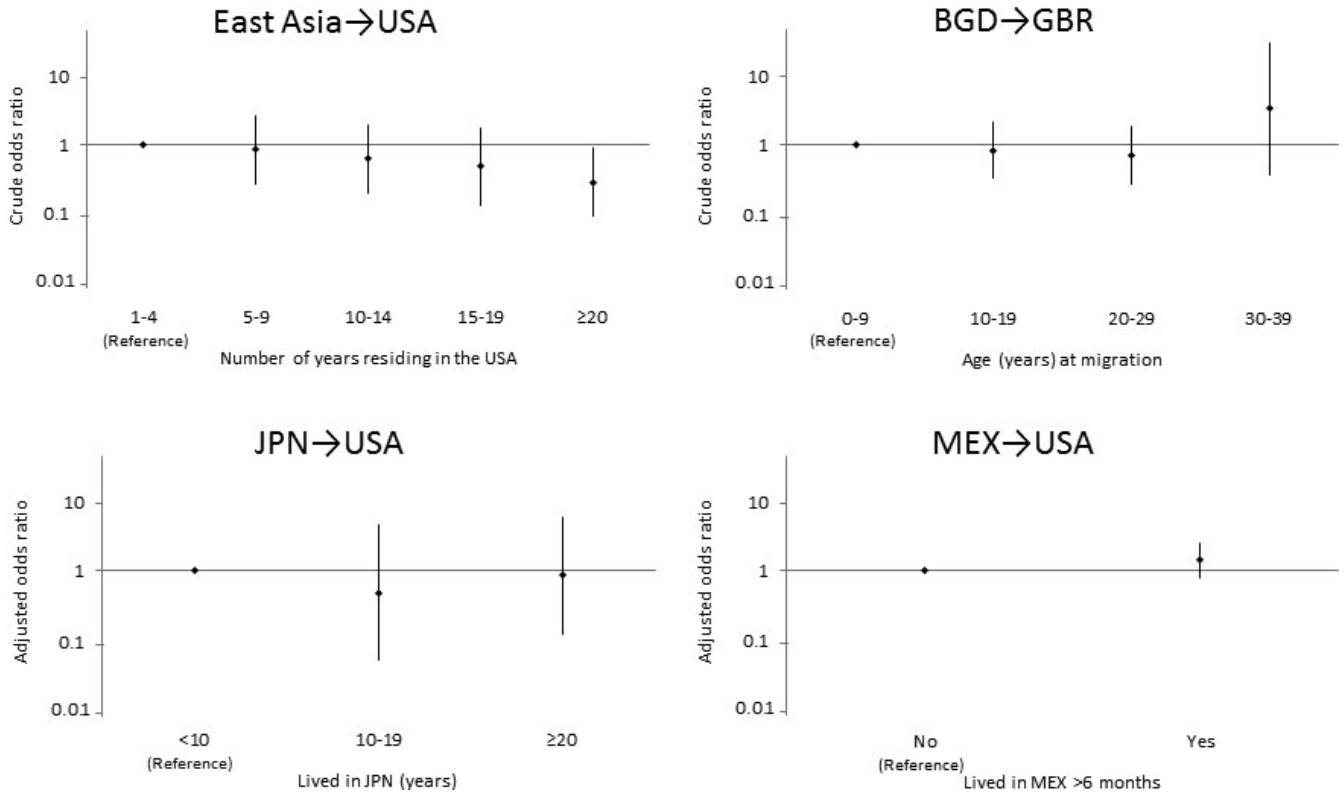

FIGURE 4 Odds ratio and corresponding 95% confidence intervals[a] for the comparison between the frequency of *H. pylori* infection in migrants and the number of years living in the origin or destination country. [a]Calculated by the authors of the present review using data provided in the original report for migrants from Bangladesh (BGD) to the United Kingdom of Great Britain and Northern Ireland (GBR).[13] →, From origin country to destination country. BGD, Bangladesh; GBR, United Kingdom of Great Britain and Northern Ireland; JPN, Japan; MEX, Mexico; USA, United States of America

prevalence of infection compared to those who had arrived more recently. Further, those who migrated later in life or with a greater number of years residing in the origin country had a higher prevalence of infection. Because *H. pylori* tends to remain present unless specifically treated,[47] migrants who arrive with the infection are expected to harbor the bacterium indefinitely. As the majority of the studies included in the review used serology, which refers to lifetime infection,[11] the prevalence of infection in migrants likely reflects that of the country of origin. Thus, such data are difficult to interpret because it is challenging to disentangle the contribution of the number of years residing in each country toward the infection.

The majority of the papers included in this systematic review referred to migrants, not specifying the reason for migration. Refugees, which presented prevalences of infection higher than both the origin and destination countries, are a distinguished group in that they fear persecution because of religious or political beliefs, or ethnicity, and they tend to be hosted by low- or middle-income countries,[3] further contributing to the higher burden of infection already present in these countries.[8] On the other hand, soldiers are also a specific type of migrant, as they move to locations for a short period of time in which they normally endure lower levels of sanitation[48] and they likely do not suffer the process of acculturation.[43]

Comparisons made with the origin and destination prevalences obtained from papers other than the one describing the migrants may have influenced our results. It should be noted that the studies are not entirely concordant regarding the period of data collection; therefore, comparisons should be made cautiously as the prevalence of infection has decreased over time, at an international level.[6] Geographic variations in the prevalence of *H. pylori* have been established not only in different countries from different regions of the world, but also within regions of a single country.[49] To minimize potential bias, we attempted to choose nationally representative or general population and age-specific estimates with a similar period of data collection. We did not use sex-specific prevalences as most of the studies did not provide sex-specific estimates for migrants according to age, generation or time since migration, which were considered more important. However, a slight male predominance of *H. pylori* infection in adults has been shown, although such relation is not apparent in children.[50]

To the best of our knowledge, this is the first systematic review on the burden of *H. pylori* in migrants worldwide, but a limitation related with the methods used for the identification of the potentially eligible studies needs to be addressed. The fact that it was based on only one electronic database may have contributed for missing studies potentially eligible. However, as data analysis was essentially descriptive, no important bias is expected from this methodological option. Furthermore, our database search relied on a comprehensive expression and was complemented by citation tracking, contributing

to increase the sensitivity of the search and for a comprehensive overview of the prevalence of *H. pylori* in migrants.

Our study findings are consistent with what would be expected based on the prevalence of *H. pylori* worldwide. The results of this review provide insight into future trends in the burden and management of the infection, and help to identify gaps in the knowledge of migrants' prevalence of infection globally.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the collaboration of Ana Bastos, Bruno Barroso and Helena Carreira for the participation in the screening of reference lists.

COMPETING INTERESTS

The authors have no competing interests.

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How to cite this article: Morais S, Costa AR, Ferro A, Lunet N, Peleteiro B. Contemporary migration patterns in the prevalence of *Helicobacter pylori* infection: A systematic review. *Helicobacter*. 2017;22:e12372. https://doi.org/10.1111/hel.12372