# Healthcare access among circular and undocumented Mexican migrants: results from a pilot survey on the Mexico-US border

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Temporary and unauthorised migrants may face unique obstacles to access healthcare services in the USA. This study estimated levels of healthcare access among Mexican migrants returning to Mexico from the USA and factors associated with access to healthcare, with emphasis on the role of modifiable, enabling factors. We conducted a pilot probability healthcare survey of migrants in the border city of Tijuana, Mexico (N = 186). Approximately 42% of migrants reported having used healthcare services in the USA during the past year. Only 38% had a usual source of care and approximately 11% went without needed medical care in the USA. About 71% of migrants did not have health insurance in the USA. Lack of health insurance and transportation limitations were significantly related to various access indicators. These results have implications for future policies and programmes aimed to address modifiable healthcare access barriers faced by these vulnerable and underserved segments of the Mexican migrant population.

**Keywords:** Mexican migrants; Andersen model; healthcare access; circular migration; unauthorised migrants.

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Norma-Jean Simon holds a Master of Public Health degree and Master of Public Affairs degree from the University of Wisconsin-Madison. In the past, she served as a research specialist on the HIV risk and access to healthcare study among Mexican migrants. She has a particular interest in the role of public health policy in creating environments that better promote health and facilitate access to healthcare services. She views the role of informed public health policy as a necessary means to decrease health disparities that persist among diverse populations in the USA.

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# 1    Introduction

Population movements play a role in the transmission and relocation of diseases across different regions. Migrants may represent bridge populations between sending and receiving communities and may challenge the ability of services in these communities to meet the health needs of both migrant and non-migrant populations. Each year, over 600,000 Mexican migrants leave Mexico to go to the USA and another 400,000 return to Mexico from the USA (Pew Hispanic Center, 2009). While migrants may return voluntarily to Mexico, they may also leave involuntarily via deportation. In 2011, almost 400,000 Mexican immigrant deportation or repatriation events from the USA were recorded, with some individuals being removed from the USA more than once in that period (Instituto Nacional de Migracion, 2012). These circular migratory patterns have important public health implications for the USA and Mexico (Zimmerman et al., 2011).

Access to healthcare is defined as the timely use of personal health services to achieve the best health outcomes (Healthy People 2020, 2014; Millman, 1993). Common healthcare access indicators include healthcare utilisation, availability of a usual source of care and forgone or delayed healthcare. Previous studies have shown that Mexican immigrants are more likely to forgo care, delay healthcare seeking and report using the emergency room or hospital as a primary source of care compared to immigrants from other countries and the general US population (Akresh, 2009). Barriers to accessing health services can result in inappropriate use of costly health services, such as emergency room visits and hospitalisations to treat health problems that could have been prevented or treated less expensively at an earlier stage. Moreover, low access to health services can translate into unmet health needs of immigrants, which in turn may endanger the health of the host and receiving populations involved in circular migration (AHRQ, 2008).

The Andersen's behavioural model of health services use provides a theoretical foundation for identifying barriers and facilitators of healthcare access and utilisation among different populations (Andersen, 1995). This model posits that healthcare access and utilisation is determined by a function of enabling, need and predisposing factors. Enabling factors are community and individual factors that may enable or impede healthcare access and can be addressed through policies and other structural changes

(Andersen, 1995). For migrant populations, examples of enabling factors that may impact access to healthcare include income, insurance, distance to healthcare facilities and legal migration status. Predisposing factors are characteristics such as socio-demographic factors, social structures and health beliefs that may affect an individual's ability to cope with presenting problems and subsequent perception of the need and use of health services. Need factors are the immediate reasons that motivate individuals to obtain care, such as the experience of symptoms of illness, pain, worries and their perceived importance.

Multiple enabling, predisposing and need factors may explain previously reported low levels of access to healthcare and scarce use of preventive healthcare services by Mexican migrants (Lara et al., 2005). Lack of health insurance and undocumented status figure prominently among the list of enabling factors that may impede access to healthcare services and have been linked to inadequate access to care and health services utilisation among Mexican immigrants (Akresh, 2009; Bustamante and Chen, 2012; Berdahl et al., 2007). In general, over half of all Mexican immigrants residing in the US are not covered by any health insurance system, representing the group with the lowest health insurance rate in the USA (National Population Council of the Government of Mexico, 2008, 2010). Unauthorised immigrants, who represent 59% of all Mexican migrants in the USA (Passel and Cohn, 2009), are less likely to have health insurance than their legal counterparts (Passel and Cohn, 2009). This is largely the result of their lack of eligibility for state-based health insurance programmes (The Kaiser Family Foundation, 2006). Even among authorised immigrants, access to government-based health insurance can be limited. Since 1996, authorised immigrants' eligibility for Medicaid is tied to their length of residency in the USA, with most of them being subject to a five-year bar on eligibility for Medicaid or CHIP (The Kaiser Family Foundation, 2006). Healthcare access indicators seem to improve with length of residence in the USA For instance, among Latino immigrants the percentage who lacks a usual source of healthcare ranges from 21% among those who have been in the USA for 15 or more years to 49% among those who have been in the USA less than five years (Livingston et al., 2008). These differences may reflect increased likelihood of obtaining health insurance with longer length of residence, as well as greater acculturation and familiarity with the healthcare system (Akresh, 2009; Castañeda et al., 2011). Existing data show that undocumented migrants are 27% less likely to have a doctor visit in the previous year and 35% less likely to have a usual source of care compared to their documented counterparts (Bustamante et al., 2012). Fear of deportation and concern about immigration penalties can deter healthcare seeking (Gwyther and Jenkins, 1998; Bade, 1999; DeToledo et al., 2003) and contribute to missed/delayed access to care among unauthorised migrants and their family members (DeToledo et al., 2003; Galloro, 2001). Distance to healthcare facilities, transportation barriers (Cristancho et al., 2008), including lack of a personal vehicle or inability to obtain a driver's license and linguistic barriers (Cordasco et al., 2011) have also been found to prevent Latino immigrants from accessing healthcare services.

In addition to the barriers listed above, predisposing factors, such as the younger age structure and mostly male gender of the Mexican migrant population (Migration Information Source, 2013), may contribute to low levels of healthcare utilisation compared to other immigrants and the US population. Cultural beliefs and social norms among Mexican migrants may also shape perceptions of health, including the perceived need for professional advice to treat different symptoms and the value placed on

prevention and utilisation of healthcare services (Rosal and Bondenlos, 2009). Previous studies with Latinos have documented a positive association between level of acculturation, or the degree of assimilation to the US mainstream culture and self-reported health status and use of some preventive services (Lara et al., 2005). Similarly, the level of English proficiency and primary language spoken at home, both commonly used proxy measures of acculturation, have also been found to be positively related to healthcare utilisation among immigrant populations in the USA (Sentell et al., 2007; Cheng et al., 2007). For Mexican migrants engaging in circular migration, regular exposure to both the USA and Mexico, length of time in the USA and language barriers are likely to result in lower rates of assimilation into the US mainstream culture compared to more established immigrant populations. Greater adherence to traditional Latino health beliefs may, in turn, reduce the perception of the need for and use of health services among Mexican circular migrants.

Finally, need factors may also explain lower levels of healthcare access among Mexican migrants. Previous literature has documented the existence of health advantages for first generation Latino immigrants compared to second and subsequent Latino generations and the US-born population (Singh and Siahpush, 2002; Abraido-Lanza et al., 2005; Guendelman and Abrams, 1995). Studies have also suggested that, among first generation immigrants, health outcomes tend to deteriorate with length of residence in the US and greater assimilation to the US culture, even after accounting for greater rates of undiagnosed disease among recent immigrants (Barcellos, 2012). In all, this evidence suggests that Mexican migrants may be in better health and have lower need for healthcare services, given shorter length of residence in the USA and low levels of acculturation, compared to the US population. However, the extent to which these predisposing, need and enabling factors play a role for circular and undocumented Mexican migrants specifically is not well understood.

Most of our knowledge regarding healthcare access among Mexican immigrants has emanated from large health surveys conducted in the USA. These data often reflect the experiences of more permanently established Mexican immigrants within the USA, but may under-represent and fail to capture the healthcare experiences of Mexican migrants who engage in circular migration patterns and/or who are undocumented. Surveys often rely on indirect methods to assess legal migration status (Mohanty et al., 2005; Stimpson et al., 2013; Goldman et al., 2005). To date we have a limited understanding of healthcare access and utilisation, including the utilisation barriers faced by circular migrants and those who are undocumented and deported from the USA. In the USA, circular and undocumented migrants represent a mobile, geographically widespread and hidden population. For undocumented migrants, fear of deportation may reduce the likelihood of participating in surveys in the USA. Even if they participate, they may not provide valid information regarding healthcare access and utilisation for fear that they or their family members may be turned in to immigration authorities or concerns that the information reported may compromise their ability to acquire legal migration status at some point in the future. In Mexico, once they are back in their communities of origin, these migrants may not recall accurately their healthcare needs and experiences in the USA. Or they may feel ashamed of reporting precarious experiences and difficulties pertaining to their stay in the USA.

We sought to estimate levels of access to healthcare among circular and undocumented Mexican migrants in the USA and examine the extent to which predisposing, need and especially, enabling factors determine healthcare access among

this transnational and poorly understood population. To respond to the challenge of reaching and obtaining valid information from this hard-to-reach population, we used a novel methodological approach. Instead of conducting a survey in the USA or in Mexican sending communities, we conducted a pilot probability survey of migrants from two migrant flows converging in the border city of Tijuana, Mexico: circular migrants returning from the US to Mexican sending communities and migrants returning to Mexico forcedly, via deportation. The survey location on the Mexican side of the border offers several advantages. First, the survey is likely to achieve better response rates from undocumented migrants given that concerns about deportation no longer apply once migrants are back in Mexico. Furthermore, by reaching migrants in the Mexican border, when experiences in the USA are still recent but while they are still far from their communities of origin, the survey may obtain more accurate and candid responses from survey respondents, resulting in greater quality of the information collected. With its focus on this special and scarcely studied subset of migrants, who can report openly on their recent experiences in the USA, this study complements previous research aimed to characterise levels of and barriers to, healthcare access among Mexican migrants in the USA. The results are of importance for future research, policy and service delivery to promote the health of migrants who, voluntarily or otherwise, engage in frequent travelling between Mexico and the USA. Due to their frequent contact with sending, receiving and transit communities, these transnational migrants must be considered in any immigration debate and in planning services in communities with large and emerging Mexican migrant populations.

## 2    Methodology

### 2.1    Study setting

The Mexican border region represents an intermediate point in the trajectory of Mexican migrants travelling to and from the USA. Human circulation is largely dictated by the transport infrastructure (Zimmerman et al., 2011). Research from migration experts indicate that most Mexican migrants travel between the two countries by ground and approximately 90% of them travel through one of eight Mexican border towns (Secretaria de Gobernacion, 2007; Santibáñez, et al., 1997). Migrants arrive at or depart from these Mexican border towns through specific sites associated with the transportation infrastructure linking these cities to the rest of Mexico as well as the USA (e.g., vehicle and pedestrian crossing points, bus stations, airports, deportation facilities). These sites provide a unique and underutilised observatory to study the health status and recent healthcare experiences of Mexican migrants travelling to or from the USA.

From September through December 2011, we conducted a pilot cross-sectional, probability survey in Tijuana, Mexico. The border city of Tijuana concentrates about 40% of the migration flow between Mexico and the USA (El Colegio de la Frontera Norte, 2010).

### 2.2    Sampling

The survey involved the use of probability sampling methods. Every three months, a random sample of venue-time pairs was generated to determine where and when the

survey was to be conducted. The temporal dimension consisted of the day of the week and survey shift. Study venues included the Tijuana International Airport, the largest bus station in Tijuana (i.e., Central Camionera de Autobuses de Tijuana) and the main deportation facility in Tijuana (i.e., Delegación Federal de Migración). The selection of venues and temporal units was done proportionally to the volume of the migrant flow travelling through each venue and time period. This sampling methodology was modelled after the large periodic survey of Mexican migrants known as the *Encuesta sobre Migración en la Frontera Norte de México* (EMIF) – a migration survey conducted by COLEF for the Secretaría del Trabajo y Previsión Social and the Consejo Nacional de Población along the Mexico-USA border (Secretaria de Gobernacion, 2007). The sampling framework was generated annually by EMIF demographers collaborating on our study.

## 2.3   Procedures

Screening and recruitment procedures have been described in detail elsewhere (Rangel et al., 2012; Amuedo-Dorantes et al., 2013). During each survey shift, individuals crossing through the sampling site were consecutively approached and screened for eligibility. At the airport the recruitment point was the doorway to the security control point. At the bus station, the ticket desk was the recruitment point. For the deportation station, the sampling point included the main exit from the immigration facility. Eligible individuals were 18 years or older, born in Mexico or other Latin American countries, fluent in Spanish, not Tijuana residents (except for the deported migrants), travelling for work, to find a job, or due to change of residence and with no history of previous participation in the survey. The survey includes four migration flows:

1   southbound migrants returning from the US to Mexican sending communities

2   deported migrants returning from the US to the Mexican border region via deportation

3   migrants arriving at Tijuana from other Mexican border regions

4   northbound migrants arriving at Tijuana from elsewhere in Mexico.

This study focused on flows #1 and #2 and their recent experiences in the USA.

Within flows #1 and #2, we approached 737 individuals for participation in the survey, out of which 257 were eligible for inclusion in the study and 212 agreed to participate. The response rate was 82.5% for the two flows combined. After excluding 26 participants who stayed in the USA for less than 30 days during the last 12 months and were therefore unlikely to be exposed to the US healthcare system, the final sample included 186 individuals (69 southbound migrants and 117 deported migrants). Among southbound migrants, reasons for returning to Mexico included visiting family or friends (n = 39; 60.0%), deportation (n = 8; 12.3%), their job ended or they could not find a job (n = 7; 10.8%) and other reasons (n = 11; 18.5%). Migrants in the southbound flow who reported returning to Mexico via deportation were nonetheless kept within the southbound subsample for our analyses. This decision was based on two factors:

1   southbound migrants who were back in Mexico due to deportation were recruited in different sampling sites (i.e., airport or bus station) compared to the deported migrant flow (i.e., deportation station)

2    these migrants were heading back voluntarily to their communities of origin after being deported.

Based on these factors, we argue that these two migrant flows represent a snapshot of migrants at different points of the migration experience, with migrants travelling in a particular flow at one point in time being likely to be part of different flow at another point in time.

## 2.4   Measures

Participants completed an anonymous healthcare questionnaire administered by an interviewer using questionnaire development system computer-assisted personal interview (QDS™ CAPI). The questionnaire followed the Andersen's behavioural model of healthcare utilisation (Andersen, 1995) and covered indicators of healthcare access, as well as predisposing, need and enabling factors.

### 2.4.1   Healthcare access

Three indicators measured access to healthcare, namely healthcare utilisation, forgone healthcare and availability of a usual source of healthcare in the USA. Healthcare utilisation (0 = no healthcare utilisation; 1 = one or more instances of healthcare utilisation) was a derived, binary variable representing *any* healthcare utilisation during the last 12 months in the USA (i.e., having received ambulatory, emergency care and/or hospital services one or more times). Forgone healthcare was based on the question 'During the last 12 months in the USA, did you go without medical care, dental care, tests or treatments you or a healthcare provider thought you needed?' and coded as 0 = no forgone care or 1 = forgone care. Availability of a usual source of care was also a binary variable (0 = no availability, 1 = availability), based on the question 'In the last 12 months in the USA, was there a specific doctor's office, clinic, medical centre or other place you usually went to when you were sick or needed health advice?'.

### 2.4.2   Predisposing factors

We measured several demographic characteristics, including age (years), gender, marital status, education level, last 12-month employment status and occupation sector. Migration variables encompassed information on length of residence in the USA during lifetime and time spent in the USA in the last 12 months. Specific categories for these variables are shown in Table 1. Use of English language was used as a proxy for level of acculturation to the US mainstream culture. English language use was measured with a four-question composite scale (range 0–8; Cronbach's $\alpha$ = 0.83), an adapted version of the 'language use' subscale of the 12-item short acculturation scale for Hispanics developed by Marin et al. (1987). Questions included what language they preferred to speak and what language they spoke at work, at home and with friends during the last 12 months in the USA. Response options included 'English always or most of the time', 'English as often as other languages' and 'other languages always or most of the time'. Higher scores indicated higher acculturation, based on English proficiency.

### 2.4.3  Need factors

To account for need factors, we used two indicators: last 12-month self-reported history of work-related burns/injuries and a composite health status scale. The scale was an adaptation of the 12-item short-form health survey (SF-12) (Ware et al., 1996), minus the first item. The first item of the SF-12 scale asked respondents to rate their health choosing one of five possible options: excellent, very good, good, fair, or poor. This item was not included in the composite scale because of the potential endogeneity of this variable. For instance, if as a result of visiting a doctor, a person is diagnosed with a disease, they may subsequently rate their own health status in worse terms compared to someone who may have the same symptoms but has not been diagnosed with the disease. However, this item was used for secondary analyses to stratify migrants by health status (i.e., excellent/very good versus good/fair/poor).

The remaining 11 items included in the composite scale asked respondents about the degree to which their health had limited their ability to perform different activities (e.g., moderate activities, climbing several flights of stairs), whether their physical health or emotional problems had affected their ability to work and engage in other regular daily activities, the frequency with which they had experienced different emotional states (e.g., calm, lot of energy, downhearted) and degree of interference of their physical and emotional problems on social activities during the last four weeks. Some items were recoded so as to have the same direction as the others. The adapted scale showed a high internal consistency level when applied to our sample (Cronbach's alpha = 0.82). Scores could range from 0 to 44, with higher scores indicating better health status.

### 2.4.4  Enabling factors

This category included unauthorised last entry to the USA (0 = no, 1 = yes) and migration flow (0 = southbound migrants; 1 = deported migrants). Unauthorised migrants experience insecure legal standing, marginalisation, social isolation, poor living and working conditions and limited access to medical, legal and other basic resources. Deported Mexican migrants are more likely to be unauthorised compared to southbound migrants, who in most cases have returned to Mexico voluntarily. Moreover, due to their forced removal from the country they may represent the healthcare experiences of migrants who would not otherwise have left the USA had they not been deported. Unauthorised entry and migration flow were used as proxies for adverse migration status that may preclude migrants from accessing health services.

Other enabling factors were health insurance availability during the last 12 months in the USA, represented by a binary variable (1 = any insurance, including private, public, or other insurance; 0 = no insurance), transportation barriers ('During the last 12 months in the USA, were you unable to go to a place you needed to go, such as work, hospital, home, or store, because you did not have transportation?' 0 = no; 1 = yes), money earned during the last 12 months in the USA (in US dollars) and state where they had spent the most time in the USA (1 = California, 0 = other states). States often vary on their policies and the degree to which they facilitate or impede access to healthcare among migrants. California has been described as a state that favours access to healthcare among migrants, compared to other states in the USA (National Population Council of the Government of Mexico, 2010).

## 2.5   *Statistical analysis*

We computed descriptive statistics for healthcare access indicators and potentially related predisposing characteristics, need and enabling factors for the entire sample and also, separately, for the voluntary return and deported flow. We compared healthcare access indicators, predisposing, need and enabling factors between the southbound and deported flows using chi-square tests (for dichotomous and categorical variables) and t-tests for independent samples (continuous measures). Unadjusted and adjusted logistic regression models were estimated to regress the three binary healthcare access measures (i.e., healthcare utilisation, availability of a usual source of care and forgone care in the USA) on predisposing, need and enabling factors. Models were estimated for the two migrant flows combined (i.e., southbound and deported migrants) and, also separately for migrants from the deported flow, given the special characteristics and understudied nature of this particular migrant flow. In addition, we also estimated separate models for those with self-reported excellent or very good health versus those with good, fair, or poor health. The results of the models stratified by health status are shown as supplementary materials.

Due to the small sample sizes, a two-step approach was employed to determine the predictors included in the final adjusted models. First, we estimated unadjusted or univariate logistic regression models. In these models, each predisposing, need and enabling factor was regressed separately on the three study outcomes. Each unadjusted model included only one outcome and one predictor at a time. Factors that achieved p-values equal to or less than 0.3 on the unadjusted models for a given outcome were then entered simultaneously into a multivariate logistic regression model for that outcome (i.e., starting model). For multivariate models, we used the backward stepwise (BSTEP) procedure. With this procedure, the regression terms that do not achieve sufficient statistical significance are removed from the starting model one by one. Based on the maximum likelihood estimates of the starting model, the likelihood ratio and associated p-value for every variable in the starting model is calculated. The first candidate for removal is the term associated with the highest p-value. The term's p-value is compared to a pre-specified cut-off value. For our analyses, we chose a cut point of significance at 0.2. If the term's p-value is higher than the cut-off, the variable is removed from the regression model. A new multivariate model with the remaining variables is then estimated and a new round begins. This process ends when no regression terms have p-values higher than the specified 'p to stay'. When more than one term has been removed from the model, this procedure involves calculating the p-value associated with restoring each of the terms previously removed, starting with the one with the smallest p-value. If the p-value of a previously removed term is smaller than a pre-specified 'p to enter' value, the term is restored in the model. P-values for every variable not in the model are calculated based on score statistics. We estimated the odds ratios (OR), 95% confidence intervals and statistical significance levels associated with each predisposing, need and enabling factor in unadjusted logistic regression models and for all factors retained in the final multivariate logistic regression models[1].

Explanatory power was calculated by first obtaining predicted values (i.e., probabilities) using the final multivariate regression model and then computing the correlation (r) between predicted and observed values. We reported the R squared values as indicators of the amount of variance in the outcome variable explained by the variables in the models. R squared values were computed before and after entering enabling factors

in the models, in order to estimate the explanatory power of the later over other predisposing or need factors (Agresti, 2007).
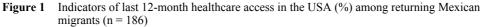
All analyses were conducted using STATA/MP 13.0 (StataCorp LP, College Station, TX).
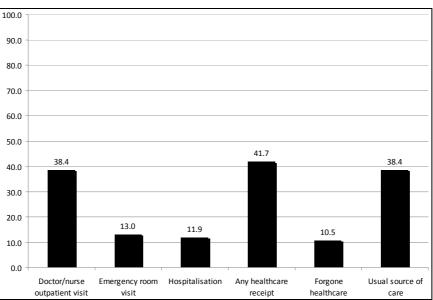
## 3    Descriptive statistics

Table 1 displays summary statistics for the study sample regarding indicators of access to healthcare, as well as predisposing, need and enabling factors. Data are presented for the entire sample and stratified by migrant flow. The table also shows p-values, based on chi-square tests and t-tests for independent samples, testing the null hypothesis that the two subsamples (i.e., migrants in the southbound flow versus those in the deported flow) are not significantly different on healthcare access and theoretical factors.

### 3.1    Healthcare access

In the last 12 months, 41.7% of migrants had utilised at least one kind of healthcare service in the USA (Figure 1). Specifically, 38.4% reported using ambulatory healthcare provided by a doctor or a nurse, 13.0% visited the emergency room and 11.9% were hospitalised. Approximately 38.4% reported having a usual source of care while in the USA, while 10.5% reported having gone without necessary medical care, tests, or treatment. Healthcare utilisation and availability of a source of care did not vary significantly between southbound and deported migrants, with the exception of a marginally significant difference in the prevalence of forgone healthcare (4.9% for voluntary return versus 14.1% for deported migrants; p =.068; Table 1).

**Figure 1**    Indicators of last 12-month healthcare access in the USA (%) among returning Mexican migrants (n = 186)

Among migrants who reported the utilisation of any health services, the majority did so for the last time in an outpatient clinic (41.2% of deported; 48.5% of southbound), a physician's private office (14.7% of deported; 27.3% of southbound), or a community clinic (10.3% of deported; 9.1% of southbound). No migrants reported utilising services provided by a health maintenance organisation (HMO), rural health clinic, school, workplace, mobile clinic, or veterans' affairs facility. Almost 3.0% of deported migrants used a migrant clinic, 1.5% used an emergency room and 29.4% used other, non-specified sources of care. Among southbound migrants, none reported using a migrant clinic, 3.0% reported using an emergency room and 12.1% other, non-specified sources of care (data not shown).

**Table 1**    Distribution of predisposing, need and enabling factors among a sample of Mexican migrants returning from the USA *via* Tijuana, Mexico (n = 186)

| | *Overall (n = 186)* | *Deported (n = 117)* | *Southbound (n = 69)* | *P[1]* |
|---|---|---|---|---|
| Healthcare access | | | | |
| Doctor/nurse outpatient visit, % | 38.4 | 35.1 | 36.9 | 0.811 |
| Emergency room visit, % | 13.0 | 13.9 | 7.6 | 0.195 |
| Hospitalisation, % | 11.9 | 10.7 | 10.6 | 0.992 |
| Any healthcare receipt, % | 41.7 | 35.7 | 44.4 | 0.255 |
| Forgone healthcare, % | 10.5 | 14.1 | 4.9 | 0.068 |
| Usual source of care, % | 38.4 | 36.5 | 39.7 | 0.685 |
| Predisposing factors | | | | |
| Male, % | 88.2 | 94.9 | 76.8 | **<0.001** |
| Age, mean (SD) | 35.3 (10.9) | 33.9 (9.4) | 37.8 (12.9) | **0.009** |
| Completed high school education, % | 21.5 | 14.5 | 33.3 | **0.003** |
| Married/cohabiting, % | 54.3 | 48.7 | 63.8 | **0.047** |
| Most usual employment status last 12 months, % | | | | 0.159 |
| • Full time employed | 63.1 | 68.5 | 54.4 | |
| • Part time employed | 10.2 | 9.3 | 11.8 | |
| • Other | 26.7 | 22.2 | 33.8 | |
| Most usual occupation last 12 months[2], % | | | | 0.369 |
| • Agriculture/farm | 15.5 | 10.2 | 19.4 | |
| • Restaurant/club | 15.5 | 15.7 | 10.5 | |
| • Factory/industry | 8.4 | 7.4 | 7.5 | |
| • Construction | 17.4 | 17.6 | 11.9 | |
| • Other | 43.2 | 49.1 | 50.8 | |

Notes: [1]P-values are based on chi-square tests (for dichotomous or categorical variables) and t-tests for independent samples (for continuous measures) testing the null hypothesis that the two subsamples (i.e., deported and southbound) are not significantly different on reported access to healthcare and theoretical factors,
[2]Sample was restricted to individuals who reported the most usual employment status during the last 12 months as full-time, part-time or self-employed,
[3]On a 0-8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[4]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 1**    Distribution of predisposing, need and enabling factors among a sample of Mexican migrants returning from the USA *via* Tijuana, Mexico (n = 186) (continued)

|  | *Overall (n = 186)* | *Deported (n = 117)* | *Southbound (n = 69)* | *P[1]* |
|---|---|---|---|---|
| Predisposing factors |  |  |  |  |
| Time spent in the US during lifetime |  |  |  | **0.019** |
| • Less than five years | 11.8 | 6.1 | 20.6 |  |
| • Five to nine years | 23.0 | 23.5 | 22.2 |  |
| • Ten years or more | 65.2 | 70.4 | 57.1 |  |
| • 12 months | 2.2 | 2.6 | 1.5 |  |
| Level of acculturation based on language[3], mean (SD) | 1.5 (1.9) | 1.4 (1.9) | 1.6 (2.0) | 0.516 |
| Need factors |  |  |  |  |
| Experienced work-related injuries/burns last 12 months, % | 3.6 | 1.9 | 6.3 | 0.146 |
| Health status score[4], mean (SD) | 35.5 (7.3) | 34.5 (7.3) | 37.2 (7.1) | **0.018** |
| Enabling factors |  |  |  |  |
| Last entry to US was unauthorised, % | 67.7 | 92.9 | 28.6 | **<0.001** |
| Health insurance (private, public or other), % | 28.9 | 21.8 | 42.2 | **0.005** |
| Money earned last 12 months (in thousands), mean (SD) | 22.1 (19.3) | 21.2 (20.9) | 24.0 (15.2) | 0.498 |
| Experienced transportation limitations, % | 20.3 | 27.2 | 8.8 | **0.003** |
| US state where most time spent (CA), % | 87.4 | 91.3 | 80.9 | **0.040** |

Notes: [1]P-values are based on chi-square tests (for dichotomous or categorical variables) and t-tests for independent samples (for continuous measures) testing the null hypothesis that the two subsamples (i.e., deported and southbound) are not significantly different on reported access to healthcare and theoretical factors, [2]Sample was restricted to individuals who reported the most usual employment status during the last 12 months as full-time, part-time or self-employed, [3]On a 0-8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation, [4]On a 0–44 scale, 0 = worst health status, 44 = best health status

Deported migrants who reported having a usual source of care described this source as an outpatient clinic (34.2%), a community clinic (21.1%), a private doctor office (18.4%), an HMO (2.6%), a migrant clinic (2.6%), or other facilities (21.1%). Among southbound migrants who reported having a usual source of care, the majority reported this to be an outpatient clinic (48.5%), a private doctor office (27.3%), a community clinic (9.1%), an emergency room (3.0%), or other sources (12.1%).

## 3.2   Predisposing factors

Mexican migrants in our sample were relatively young (almost two thirds were between 26 and 45 years old), with the majority of respondents being male (88.2%). Only 21.5% had completed high school education and almost all of them (99.5%) regarded Mexico as their country of origin. During the last 12 months, 63.1% of the migrants reported being employed full-time. Approximately 17.4%, 15.5% and 15.5% worked on the construction, agriculture/farm and restaurant/hospitality sectors, respectively, with 43.2% working on a variety of other less prevalent sectors. Almost two thirds of survey respondents had spent ten years or more in the USA. During the previous year, 89.3% spent 6–11 months in the USA. Only 2% had spent the entire 12 months in the USA, attesting to their circular mobility. In general, the level of acculturation was low, as reflected by a 1.5 average score (SD = 1.9) on the 0–8 English language scale, with higher scores reflecting more use of English (Table 1).

Southbound and deported migrants differed in several predisposing characteristics, including greater male representation (p < .001) and younger age (p < 009) among the deported flow. Deported migrants were also less likely to have completed high school education (p = .003) or be married/cohabiting (p = .047), but more likely to have spent ten years or more in the USA (p = .019).

## 3.3   Need factors

The prevalence of work-related injuries/burns during the 12 months prior to the survey was 3.6% (1.9% among deported and 6.3% among southbound migrants). The composite health status score was 35.5 (SD=7.3) for the whole sample and significantly lower for deported (Mean=34.5, SD=7.3) compared to southbound migrants (mean = 37.2, SD = 7.1; p=.018; Table 1). About 41.6% of migrants reported their health status was excellent or very good, while 58.4% reported their health was only good, fair, or poor; the distribution of the dichotomous health status variable did not differ significantly between migrants from southbound and deported flows (p = 0.115, data not shown).

## 3.4   Enabling factors

By design, migrants from the deported flow represented 63% of the study sample. A sizable proportion of migrants in our sample (67.7%) reported that their most recent entry into the USA was unauthorised, including 28.6% of migrants in the southbound flow and 92.9% of migrants in the deported flow (Table 1). Among those living in the USA for over ten years, 71.3% reported unauthorised last entry in the USA and 68.7% were returning to Mexico via deportation (data not shown). Barely 28.9% of the participants reported having ever had health insurance (private, public or other) in the USA during the last 12 months. About one out of five respondents (20.3%) reported transportation barriers. The average amount of money earned during the previous 12 months in the USA was $22,100 (SD = 19,300). The majority reported California as the state where they had spent most of their time in the USA (87.4%; Table 1). Enabling factors differed significantly between southbound and deported migrants. The latter were more likely to report unauthorised entry to the USA (p < .001), transportation limitations (p = .003) and having spent most of the time in California (p = .040), but less likely to have health insurance compared to southbound migrants (p = .005; Table 1).

**Table 2**    Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Predisposing factors** | | | | | | |
| Gender | | | | | | |
| • Female | 47.6 | Ref. | -- | 60.0 | Ref. | -- |
| • Male | 40.9 | 0.76 (0.30–1.90) | -- | 38.5 | 0.42 (0.07–2.62) | -- |
| Age | -- | 1.02 (0.99–1.05)* | -- | -- | 1.01 (0.97–1.05) | -- |
| Education level | | | | | | |
| • Lower than high school | 40.5 | Ref. | -- | 38.4 | Ref. | -- |
| • Completed high school education | 46.0 | 1.25 (0.60–2.61) | -- | 46.7 | 1.41 (0.47–4.24) | -- |
| Marital status | | | | | | |
| • Single | 43.2 | Ref. | -- | 46.2 | Ref.* | -- |
| • Married/cohabiting | 40.5 | 0.89 (0.48–1.67) | | 32.7 | 0.57 (0.25–1.27) | |
| Most usual employment status last 12 months | | | -- | | | |
| • Full time employed | 40.0 | Ref. | | 36.4 | Ref. | -- |
| • Part time employed | 50.0 | 1.50 (0.52–4.32) | | 50.0 | 1.75 (0.40–7.64) | |
| • Other | 40.5 | 1.02 (0.49–2.13) | | 40.1 | 1.21 (0.45–3.25) | |

Notes: *$p \leq 0.30$ in unadjusted analyses, [a]$p < 0.1$, [b]$p < 0.05$, [c]$p < 0.01$
[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the overall sample (e.g., 47.6% of all females and 40.9% of all males reported having received care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the deported sample (e.g., 60% of deported females and 38.5% of deported males reported having received healthcare). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p <= .05$ in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

Table 2

*Healthcare access among circular and undocumented Mexican migrants* 73

Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants (continued)

| Factors | Overall (n = 186) | | | Deported (n =117) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| Predisposing factors | | | | | | |
| Most usual occupation last 12 months | | | | | | |
| • Agriculture/farm | 22.7 | Ref.* | Ref | 22.2 | Ref.* | Ref |
| • Restaurant/club | 38.1 | 2.09 (0.55–7.91) | 1.36 (0.32–5.70) | 20.0 | 0.88 (0.12–6.58) | 0.38 (0.04–3.94) |
| • Factory/industry | 63.6 | **5.95 (1.22–29.0)**[b] | **5.64 (1.04–30.7)**[b] | 33.3 | 1.75 (0.17–17.7) | 0.78 (0.06–11.0) |
| • Construction | 40.0 | 2.27 (0.63–8.14) | 2.70 (0.68–10.7) | 33.3 | 1.75 (0.27–11.2) | 2.09 (0.27–16.1) |
| • Other | 44.9 | 2.77 (0.93–8.25)[a] | 2.39 (0.73–7.79) | 50.0 | 3.50 (0.66–18.6) | 3.18 (0.50–20.3) |
| Time spent in the US during lifetime | | | -- | | | |
| • Less than five years | 21.1 | Ref.* | | 50.0 | Ref. | -- |
| • Five to nine years | 31.4 | 1.72 (0.46–6.39) | | 36.4 | 0.57 (0.09–3.53) | |
| • Ten years or more | 48.1 | **3.47 (1.08–11.2)**[b] | | 39.1 | 0.64 (0.12–3.42) | |
| Time spent in the US last 12 months | | | | | | |
| • Less than six months | 21.4 | Ref.* | Ref | 50.0 | Ref. | -- |
| • 6–11 months | 43.8 | 2.86 (0.77–13.2) | 3.52 (0.64–19.5) | 39.4 | 0.65 (0.09–4.81) | |
| • 12 months | 33.3 | 1.83 (0.12–27.8) | 0.95 (0.04–20.6) | 33.3 | 0.50 (0.02–11.1) | |
| Level of acculturation based on language scale[4] | -- | 1.12 (0.94–1.33)* | -- | -- | 1.07 (0.87–1.32) | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01

[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the overall sample (e.g., 47.6% of all females and 40.9% of all males reported having received care). Percentages are therefore not expected to add up to 100%,

[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the deported sample (e.g., 60% of deported females and 38.5% of deported males reported having received healthcare). Percentages are therefore not expected to add up to 100%,

[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p < = .05 in final model,

[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,

[5]Self-reported history over the last 12 months,

[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 2**     Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants (continued)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Need factors** | | | | | | |
| Work-related injuries/burns[5] | | | | | | |
| • No | 40.1 | Ref.* | -- | 37.6 | -- | -- |
| • Yes | 83.3 | 7.46 (0.85–65.4)[a] | | 100.0 | -- | |
| Health status score[6] | -- | **0.95 (0.91–1.00)**\*[b] | **0.94 (0.89–0.99)**[b] | -- | 0.98 (0.93–1.04) | -- |
| **Enabling factors** | | | | | | |
| Last entry into the US | | | | | | |
| • Unauthorised | 40.7 | Ref. | -- | 37.8 | Ref. | -- |
| • Authorised | 44.0 | 1.14 (0.58–2.25) | | 57.1 | 2.20 (0.46–10.4) | |
| Return to Mexico was due to deportation | | | | | | |
| • No | 45.2 | Ref. | -- | -- | -- | -- |
| • Yes | 39.6 | 0.80 (0.42–1.51) | | | | |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01
[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the overall sample (e.g., 47.6% of all females and 40.9% of all males reported having received care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the deported sample (e.g., 60% of deported females and 38.5% of deported males reported having received healthcare). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p < = .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 2** Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants (continued)

| Factors | Overall (n = 186) | | | Deported (n =117) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Enabling factors** | | | | | | |
| Health insurance | | | | | | |
| • No insurance | 33.9 | Ref.* | Ref. | 32.1 | Ref.* | Ref. |
| • With insurance | 61.7 | 3.14 (1.55–6.34)c | **3.05 (1.42–6.56)**c | 68.2 | **4.54 (1.65–12.5)**c | **8.94 (2.47–32.3)**c |
| Money earned last 12 months (in thousands) | -- | 1.01 (0.98–1.04) | -- | -- | 1.00 (0.97–1.03) | -- |
| Transportation limitations | | | | | | |
| • No | 44.2 | Ref.* | Ref | 44.4 | Ref.* | Ref. |
| • Yes | 33.3 | 0.63 (0.28–1.41) | 0.50 (0.20–1.29) | 28.6 | 0.50 (0.19–1.28) | 0.31 (0.09–1.04)a |
| US state where most time spent | | | | | | |
| • Other states | 45.0 | Ref. | -- | 62.5 | Ref.* | -- |
| • CA | 41.3 | 0.86 (0.33–2.20) | -- | 37.2 | 0.36 (0.08–1.61) | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, ap < 0.1, bp < 0.05, cp < 0.01
[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the overall sample (e.g., 47.6% of all females and 40.9% of all males reported having received care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the deported sample (e.g., 60% of deported females and 38.5% of deported males reported having received healthcare). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 3**    Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrant

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Usual source of care %[1] | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Usual source of care %[2] | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Predisposing factors** | | | | | | |
| Gender | | | | | | |
| • Female | 33.3 | Ref. | -- | 40.0 | Ref. | -- |
| • Male | 39.2 | 1.29 (0.49–3.39) | -- | 37.5 | 0.90 (0.14–5.65) | -- |
| Age | -- | 1.02 (0.99–1.05)* | -- | -- | 1.02 (0.98–1.06) | -- |
| Education level | | | | | | |
| • Lower than high school | 40.2 | Ref. | -- | 38.4 | Ref. | -- |
| • Completed high school education | 32.4 | 0.72 (0.33–1.55) | | 33.3 | 0.80 (0.25–2.56) | |
| Marital status | | | | | | |
| • Single | 40.8 | Ref. | -- | 41.5 | Ref. | -- |
| • Married/cohabiting | 36.4 | 0.83 (0.44–1.56) | | 33.3 | 0.70 (0.31–1.59) | |
| Most usual employment status last 12 months | | | | | | |
| • Full time employed | 38.0 | Ref. | -- | 33.9 | Ref. | -- |
| • Part time employed | 37.5 | 0.98 (0.33–2.91) | | 37.5 | 1.17 (0.26–5.37) | |
| • Other | 35.7 | 0.91 (0.43–1.92) | | 40.9 | 1.35 (0.50–3.65) | |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the overall sample (e.g., 33.9% of all females and 39.2% of all males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the deported sample (e.g., 40% of deported females and 37.5% of deported males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 3**     Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrant (continued)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | *Usual source of care[1] %* | *Unadjusted model OR (95% CI)* | *Adjusted model[3] OR (95% CI)* | *Usual source of care[2] %* | *Unadjusted model OR (95% CI)* | *Adjusted model[3] OR (95% CI)* |
| **Predisposing factors** | | | | | | |
| Most usual occupation last 12 months | | | | | | |
| • Agriculture/farm | 31.8 | Ref. | -- | 33.3 | Ref. | -- |
| • Restaurant/club | 42.9 | 1.61 (0.46–5.59) | | 26.7 | 0.73 (0.12–2.39) | |
| • Factory/industry | 45.5 | 1.79 (0.40–7.91) | | 33.3 | 1.00 (0.11–8.95) | |
| • Construction | 36.0 | 1.21 (0.36–4.06) | | 29.4 | 0.83 (0.15–4.72) | |
| • Other | 37.2 | 1.27 (0.46–3.47) | | 41.7 | 1.43 (0.32–6.40) | |
| Time spent in the US during lifetime | | | | | | |
| • Less than five years | 21.1 | Ref.* | -- | 50.0 | Ref. | -- |
| • Five to nine years | 29.7 | 1.59 (0.43–5.87) | | 34.8 | 0.53 (0.0–3.28) | |
| • Ten years or more | 42.9 | 2.81 (0.87–9.05)[a] | | 34.8 | 0.53 (0.10–2.85) | |
| Time spent in the US last 12 months | | | | | | |
| • Less than six months | 35.7 | Ref. | -- | 50.0 | Ref. | -- |
| • 6–11 months | 38.8 | 1.14 (0.36–3.57) | | 37.2 | 0.59 (0.08–4.40) | |
| • 12 months | | | | | | |
| Level of acculturation based on language scale[4] | -- | 1.09 (0.92–1.29) | -- | -- | 1.02 (0.83–1.26) | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the overall sample (e.g., 33.9% of all females and 39.2% of all males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the deported sample (e.g., 40% of deported females and 37.5% of deported males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 3** Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrant (continued)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Usual source of care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Usual source of care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| Need factors | | | | | | |
| Work-related injuries/burns[5] | | | | | | |
| • No | 38.0 | Ref. | -- | 37.4 | Ref. | -- |
| • Yes | 50.0 | 1.63 (0.32–8.35) | -- | 50.0 | 1.68 (0.10–27.6) | -- |
| Health status score[6] | -- | **0.96 (0.91–1.00)*b** | 0.96 (0.92–1.01)[a] | -- | 0.98 (0.93–1.03) | -- |
| Enabling factors | | | | | | |
| Last entry into the US | | | | | | |
| • Unauthorised | 36.7 | Ref. | -- | 35.2 | Ref. | -- |
| • Authorised | 39.2 | 1.11 (0.56–2.21) | -- | 42.9 | 1.38 (0.29–6.56) | -- |
| Return to Mexico was due to deportation | | | | | | |
| • No | 39.7 | Ref. | -- | -- | -- | -- |
| • Yes | 37.6 | 0.92 (0.48–1.75) | -- | -- | -- | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the overall sample (e.g., 33.9% of all females and 39.2% of all males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the deported sample (e.g., 40% of deported females and 37.5% of deported males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 3** Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrant (continued)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Usual source of care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Usual source of care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Enabling factors** | | | | | | |
| Health insurance | | | | | | |
| • No insurance | 28.5 | Ref.* | Ref. | 29.1 | Ref.* | Ref. |
| • With insurance | 62.5 | **4.19 (2.06–8.53)**c | **4.01 (1.96–8.23)**c | 68.2 | **5.22 (1.88–14.5)**c | **5.22 (1.88–14.5)** |
| Money earned last 12 months (in thousands) | -- | 1.00 (0.98–1.03) | -- | -- | 0.99 (0.96–1.02) | -- |
| Transportation limitations | | | | | | |
| • No | 37.7 | Ref. | -- | 40.3 | Ref. | -- |
| • Yes | 42.4 | 1.22 (0.56–2.65) | | 32.1 | 0.70 (0.28–1.77) | |
| US state where most time spent | | | | | | |
| • Other states | 55.0 | Ref.* | | 75.0 | Ref. | |
| • CA | 36.1 | 0.46 (0.18–1.19) | | 34.4 | **0.17 (0.03–0.92)**b | |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the overall sample (e.g., 33.9% of all females and 39.2% of all males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the deported sample (e.g., 40% of deported females and 37.5% of deported males reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 4**   Predisposing, need and enabling factors associated with forgone healthcare in the USA among returning Mexican migrants (n = 186)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Forgone care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Forgone care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Predisposing factors** | | | | | | |
| Gender | | | | | | |
| • Female | 15.0 | Ref. | -- | 40.0 | Ref.* | -- |
| • Male | 9.9 | 0.62 (0.16–2.40) | | 12.8 | 0.22 (0.03–1.47) | |
| Age | -- | 1.01 (0.96–1.06) | -- | -- | 1.04 (0.97–1.10)* | 1.05 (0.98–1.13) |
| Education level | | | | | | |
| • Lower than high school | 11.1 | Ref. | -- | 15.6 | Ref. | -- |
| • Completed high school education | 8.6 | 0.75 (0.20–2.80) | | 7.1 | 0.42 (0.05–3.49) | |
| Marital status | | | | | | |
| • Single | 11.4 | Ref. | -- | 16.3 | Ref. | -- |
| • Married/cohabiting | 9.8 | 0.84 (0.30–2.36) | | 11.9 | 0.69 (0.21–2.31) | |
| Most usual employment status last 12 months | | | | | | |
| • Full time employed | 9.6 | Ref. | -- | 11.9 | Ref. | -- |
| • Part time employed | 20.0 | 2.36 (0.56–9.96) | | 28.6 | 2.97 (0.48–18.4) | |
| • Other | 7.9 | 0.81 (0.21–3.17) | | 15.0 | 1.31 (0.30–5.64) | |

Notes: *$p \leq 0.30$ in unadjusted analyses, [a]$p < 0.1$, [b]$p < 0.05$, [c]$p < 0.01$,
[1]Figures represent the percentage who reported forgone care within subgroups represented in each row in the overall sample (e.g., 15.0% of all females and 9.9% of all males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who reported forgone care within subgroups represented in each row for the deported sample (e.g., 40.0% of deported females and 12.8% of deported males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p <= .05$ in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5] Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 4**     Predisposing, need and enabling factors associated with forgone healthcare in the USA among returning Mexican migrants (n = 186) (continued)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | *Forgone care[1] %* | *Unadjusted model OR (95% CI)* | *Adjusted model[3] OR (95% CI)* | *Forgone care[2] %* | *Unadjusted model OR (95% CI)* | *Adjusted model[3] OR (95% CI)* |
| Predisposing factors | | | | | | |
| Most usual occupation last 12 months | | | | | | |
| • Agriculture/farm | 0.0 | -- | -- | 0.0 | -- | -- |
| • Restaurant/club | 10.0 | Ref.* | Ref. | 14.3 | Ref. | |
| • Factory/industry | 22.2 | 5.29 (0.63–44.0) | **38.3 (2.49–593)**[c] | 25.0 | 3.17 (0.22–46.7) | |
| • Construction | 16.7 | 3.70 (0.62–22.0) | **10.5 (1.18–93.1)**[b] | 18.9 | 2.19 (0.32–15.0) | |
| • Other | 9.5 | 1.93 (0.38–9.79) | 1.80 (0.26–12.5) | 13.3 | 1.46 (0.27–7.93) | |
| Time spent in the US during lifetime | | | | | | |
| • Less than five years | 5.9 | Ref. | -- | 16.7 | Ref. | -- |
| • Five to nine years | 11.4 | 2.06 (0.21–20.0) | | 19.1 | 1.18 (0.11–13.1) | |
| • Ten years or more | 11.3 | 2.05 (0.25–17.0) | | 12.9 | 0.74 (0.08–7.18) | |
| Time spent in the US last 12 months | | | | | | |
| • Less than six months | 0.0 | -- | -- | 0.0 | -- | -- |
| • 6–11 months | 11.0 | Ref.* | | 14.1 | Ref. | |
| • 12 months | 33.3 | 4.47 (0.38–52.2) | | 33.3 | 3.17 (0.27–27.7) | |
| Level of acculturation based on language scale[4] | -- | 1.12 (0.93–1.34)*[a] | -- | -- | 1.10 (0.90–1.35) | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who reported forgone care within subgroups represented in each row in the overall sample (e.g., 15.0% of all females and 9.9% of all males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who reported forgone care within subgroups represented in each row for the deported sample (e.g., 40.0% of deported females and 12.8% of deported males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5] Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 4**    Predisposing, need and enabling factors associated with forgone healthcare in the USA among returning Mexican migrants (n = 186) (continued)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Forgone care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Forgone care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Need factors** | | | | | | |
| Work-related injuries/burns[5] | | | | | | |
| • No | 10.3 | Ref. | -- | 14.6 | -- | -- |
| • Yes | 16.7 | 1.75 (0.19–16.0) | -- | 0.0 | -- | -- |
| Health status score[6] | -- | **0.89 (0.84–0.95)**\*c | **0.84 (0.77–0.92)**c | -- | **0.89 (0.82–0.96)**\*c | **0.90 (0.83–0.97)**c |
| **Enabling factors** | | | | | | |
| Last entry into the US | | | | | | |
| • Unauthorised | 12.8 | Ref.* | -- | 14.3 | Ref. | -- |
| • Authorised | 6.4 | 0.47 (0.13–1.72) | -- | 20.0 | 1.50 (0.15–14.6) | -- |
| Return to Mexico was due to deportation | | | | | | |
| • No | 4.9 | Ref.* | -- | -- | -- | -- |
| • Yes | 14.3 | 3.22 (0.88–11.8)a | -- | -- | -- | -- |

Notes: $*p \leq 0.30$ in unadjusted analyses, $^a p < 0.1$, $^b p < 0.05$, $^c p < 0.01$,

[1] Figures represent the percentage who reported forgone care within subgroups represented in each row in the overall sample (e.g., 15.0% of all females and 9.9% of all males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,

[2] Figures represent the percentage who reported forgone care within subgroups represented in each row for the deported sample (e.g., 40.0% of deported females and 12.8% of deported males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,

[3] Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p <= .05$ in final model,

[4] On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,

[5] Self-reported history over the last 12 months,

[6] On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table 4** Predisposing, need and enabling factors associated with forgone healthcare in the USA among returning Mexican migrants (n = 186) (continued)

| Factors | Overall (n = 186) | | | Deported (n = 117) | | |
|---|---|---|---|---|---|---|
| | Forgone care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Forgone care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| *Enabling factors* | | | | | | |
| Health insurance | | | | | | |
| • No insurance | 11.7 | Ref. | -- | 13.0 | Ref. | -- |
| • With insurance | 8.2 | 0.67 (0.21–2.21) | -- | 18.2 | 1.48 (0.41–5.38) | -- |
| Money earned last 12 months (in thousands) | -- | 0.98 (0.94–1.02) | -- | -- | 0.98 (0.94–1.03) | -- |
| Transportation limitations | | | | | | |
| • No | 7.4 | Ref.* | Ref | 10.6 | Ref.* | Ref. |
| • Yes | 24.1 | **3.99 (1.35–11.9)**[b] | **7.32 (1.76–30.5)**[c] | 25.0 | 2.81 (0.67–29.9)[a] | 3.02 (0.77–11.8) |
| US state where most time spent | | | | | | |
| • Other states | 10.0 | Ref. | | 25.0 | Ref. | |
| • CA | 10.6 | 1.07 (0.22–5.09) | | 13.3 | 0.46 (0.08–2.56) | |

Notes: *$p \leq 0.30$ in unadjusted analyses, [a]$p < 0.1$, [b]$p < 0.05$, [c]$p < 0.01$,
[1]Figures represent the percentage who reported forgone care within subgroups represented in each row in the overall sample (e.g., 15.0% of all females and 9.9% of all males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who reported forgone care within subgroups represented in each row for the deported sample (e.g., 40.0% of deported females and 12.8% of deported males reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p \leq .05$ in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5] Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

# 4    Results

Tables 2–4 show the ORs estimated in unadjusted and adjusted models for each factor in relation to the three study outcomes. The tables identify with an asterisk the factors that achieved a p-value lower than .30 and, therefore, entered into the starting full multivariate models. In addition, the tables show the ORs, 95% CIs and significance level for the terms retained in the final adjusted model.

## 4.1    Factors associated with healthcare utilisation

Table 2 shows the unadjusted associations between *any healthcare utilisation* in the USA and each of the predisposing, need and enabling factors examined in this study for the entire sample and, separately, for deported migrants. The table also shows the adjusted odds ratios (AOR) for the variables retained in the final regression models. For the entire sample, the final model indicated that last 12-month receipt of any healthcare in the USA was significantly and independently associated with manufacturing occupation in the USA, health status and health insurance coverage. Migrants working in the factory/industry sector had 5.6 higher odds of reporting having utilised healthcare (AOR = 5.64) compared to individuals who worked in the agriculture/farm sector. Health status was inversely related to the odds of utilising healthcare (AOR = 0.94), with a 6% increase in the odds of reporting healthcare utilisation for every unit increase in health status scores. Migrants who reported having had health insurance were three times more likely than migrants without health insurance to report the utilisation of healthcare services in the USA (AOR = 3.05). Time spent in the USA was found to be associated with the odds of reporting healthcare use in the unadjusted models. However, this variable was not retained in the final multivariate model, after other variables were adjusted for.

For deported migrants, the only variable significantly associated with healthcare utilisation was availability of health insurance. Deported migrants who had health insurance were almost nine times more likely to report the utilisation of healthcare services compared to deported migrants who did not have health insurance (AOR = 8.94; Table 2).

## 4.2    Factors associated with availability of a usual source of care

Table 3 displays the associations between predisposing, need and enabling factors and the odds of *having a usual source of care in the USA* for the entire sample and separately for deported migrants. The results from final adjusted models indicate that having health insurance (AOR = 4.01) was the only factor significantly associated with the likelihood of having a usual source of care among the whole sample of Mexican migrants and also among the deported migrant subset (AOR = 5.22). Among the entire sample, migrants with health insurance had four times the odds of reporting having a regular source of care compared to migrants without health insurance. For deported migrants, having health insurance more than quintupled the odds of having a usual source of care. None of the other enabling factors, nor any of the predisposing or need factors showed a statistical

association with the likelihood of having a usual source of care. For the deported subsample, unadjusted models also indicated that living in California was negatively associated with having a usual source of care. However, this association lost significance after including other variables in the model. In fact, the state variable was not retained in the final model.

## 4.3   Factors associated with forgone healthcare

With regard to factors associated with *forgone healthcare* (Table 4), the final model estimated with both southbound return and deported migrants indicated that last 12-month forgone care in the USA was 38 times more likely among migrants who worked in the factory/industry sector (OR = 38.3) and almost 11 times more likely among migrants who worked in the construction sector (AOR = 10.5) compared to those working in the hospitality sector; Table 4. The model also showed that forgone healthcare was also significantly less likely as health status scores were higher (AOR = 0.84). For every unit increase in health status scores, the odds of reporting having gone without necessary healthcare decreased by 16%. In addition, forgone healthcare was seven times more likely among those who experienced transportation limitations (OR = 7.32) compared to those who did not face these barriers. For deported migrants, only health status scores emerged as significant predictors of forgone healthcare (AOR = 0.90), with the odds of forgone care decreasing by 10% for every unit increase in health status scores. Having experienced transportation limitations was retained in the final model for deported migrants, but the AOR did not achieve statistical significance (AOR = 3.02). It must be noted that none of the respondents works in the agriculture/farming sector or having spent less than six months in the USA reported having gone without needed medical care in the USA. Consequently, these cases were excluded from adjusted and unadjusted regression models because of lack of variance in the outcome.

## 4.4   Factors associated with healthcare access indicators for migrants stratified according to health status

In general, models stratified by health status (excellent or very good versus good, fair, or poor) showed similar results to those estimated for the entire sample or the deported only subsample with the exception of a lesser role for the health status score (given that samples were already stratified by health status). Insurance continued to play a significant role as a determinant of healthcare utilisation and availability of a source of care, but only for those with good, fair, or poor health. Transportation was retained in the final models for forgone care, although the association did not reach statistical significance (Tables S1–S3).

**Table S1**     Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants by self-reported health status

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Predisposing factors** | | | | | | |
| Gender | | | | | | |
| • Female | 20.0 | Ref. | -- | 56.3 | Ref. | -- |
| • Male | 34.9 | 2.14 (0.23–20.3) | -- | 46.7 | 0.68 (0.23–2.02) | -- |
| Age | -- | 1.00 (0.95–1.05) | -- | -- | 1.02 (0.99–1.06) | -- |
| Education level | | | | | | |
| • Lower than high school | 33.3 | Ref. | -- | 46.0 | Ref. | -- |
| • Completed high school education | 35.0 | 1.08 (0.36–3.20) | | 58.8 | 1.68 (0.58–4.89) | |
| Marital status | | | | | | |
| • Single | 37.1 | Ref. | -- | 48.7 | Ref. | -- |
| • Married/cohabiting | 30.6 | 0.74 (0.28–2.00) | -- | 48.1 | 0.97 (0.42–2.24) | |
| Most usual employment status last 12 months | | | | | | |
| • Full time employed | 35.4 | Ref. | | 44.2 | Ref. | -- |
| • Part time employed | 42.9 | 1.37 (0.27–6.84) | | 62.5 | 2.10 (0.45–9.73) | |
| • Other | 23.1 | 0.55 (0.13–2.26) | | 48.3 | 1.17 (0.47–2.93) | |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the subsample with excellent/very good health (e.g., 20.0% of females and 34.9% of males with excellent/very good health reported having received care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the subsample with good/fair/poor health (e.g., 56.3% of females and 46.7% of males with good/fair/poor health reported having received healthcare). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p < = .05 in final model
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S1** Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Predisposing factors** | | | | | | |
| **Most usual occupation last 12 months** | | | | | | |
| • Agriculture/farm | 26.7 | Ref.* | Ref | 14.3 | Ref.* | Ref |
| • Restaurant/club | 40.0 | 1.83 (0.22–15.3) | 1.27 (0.14–11.3) | 37.5 | 3.60 (0.34–37.6) | 5.68 (0.32–99.5) |
| • Factory/industry | 25.0 | 0.92 (0.07–11.6) | 0.74 (0.06–9.59) | 85.7 | **36.0 (1.80–718)**[b] | **85.7 (2.63–2797)**[b] |
| • Construction | 50.0 | 2.75 (0.55–13.7) | 4.09 (0.67–25.0) | 30.8 | 2.67 (0.24–30.1) | 8.43 (0.51–175) |
| • Other | 31.3 | 1.25 (0.32–4.90) | 1.08 (0.26–4.50) | 54.4 | 7.14 (0.80–64.1)[a] | **17.7 (1.05–298)**[b] |
| **Time spent in the US during lifetime** | | | | | | |
| • Less than five years | 22.2 | Ref. | | 22.2 | Ref.* | -- |
| • Five to nine years | 21.4 | 0.95 (0.13–7.23) | | 38.1 | 2.15 (0.36–13.0) | |
| • Ten years or more | 36.4 | 2.00 (0.37–10.8) | | 56.7 | 4.58 (0.88–23.9)[a] | |
| **Time spent in the US last 12 months** | | | | | | |
| • Less than six months | 10.0 | Ref.* | Ref. | 66.7 | Ref. | -- |
| • 6–11 months | 36.7 | 5.21 (0.62–43.9) | 2.10 (0.37–12.0) | 48.8 | 0.48 (0.04–5.46) | |
| • 12 months | 100.0 | -- | -- | 0.0 | -- | |
| Level of acculturation based on language scale[4] | -- | 1.11 (0.84–1.46) | -- | -- | 1.12 (0.89–1.39) | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the subsample with excellent/very good health (e.g., 20.0% of females and 34.9% of males with excellent/very good health reported having received care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the subsample with good/fair/poor health (e.g., 56.3% of females and 46.7% of males with good/fair/poor health reported having received healthcare). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S1**    Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Need factors** | | | | | | |
| Injuries/burns[5] | | | | | | |
| • No | 32.9 | | | 46.5 | Ref.* | Ref. |
| • Yes | 100.0 | | | 80.0 | 4.60 (0.49–42.9) | 10.8 (0.79–149)[a] |
| Health status score[6] | -- | 1.00 (0.90–1.10) | -- | -- | 0.95 (0.90–1.01)*[a] | 0.95 (0.89–1.01) |
| **Enabling factors** | | | | | | |
| Last entry into the US | | | | | | |
| • Unauthorised | 30.8 | Ref. | | 46.4 | Ref. | -- |
| • Authorised | 34.5 | 1.18(0.43–3.29) | | 57.1 | 1.54 (0.58–4.13) | |
| Return to Mexico was due to deportation | | | | | | |
| • No | 34.4 | Ref. | | 58.6 | Ref.* | -- |
| • Yes | 33.3 | 0.95 (0.36–2.56) | | 43.6 | 0.54 (0.22–1.33) | |

Notes: *$p \leq 0.30$ in unadjusted analyses, [a] $p < 0.1$, [b] $p < 0.05$, [c] $p < 0.01$,
[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the subsample with excellent/very good health (e.g., 20.0% of females and 34.9% of males with excellent/very good health reported having received care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the subsample with good/fair/poor health (e.g., 56.3% of females and 46.7% of males with good/fair/poor health reported having received healthcare). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p \leq .05$ in final model
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S1** Predisposing, need and enabling factors associated with healthcare receipt in the USA among returning Mexican migrants by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Received healthcare[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Received healthcare[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Enabling factors** | | | | | | |
| Health insurance | | | | | | |
| • No insurance | 32.1 | Ref. | -- | 36.2 | Ref.* | Ref. |
| • With insurance | 42.9 | 1.58 (0.48–5.25) | -- | 69.7 | 4.05 (1.62–10.1)ᶜ | **4.29 (1.43–12.8)**ᶜ |
| Money earned last 12 months (in thousands) | 1.00 (0.97–1.03) | -- | | 1.02 (0.98–1.07) | -- | -- |
| Transportation limitations | | | | | | |
| • No | 39.7 | Ref.* | Ref | 48.6 | Ref. | -- |
| • Yes | 8.3 | 0.14 (0.02–1.15)ᵃ | **0.10 (0.01–0.98)**ᵇ | 47.6 | 0.96 (0.36–2.55) | |
| US state where most time spent | | | | | | |
| • Other states | 37.5 | Ref. | | 54.6 | Ref. | |
| • CA | 33.3 | 0.83 (0.18–3.83) | | 47.5 | 0.75 (0.21–2.67) | |

Notes: *p ≤ 0.30 in unadjusted analyses, ᵃp < 0.1, ᵇp < 0.05, ᶜp < 0.01,
[1]Figures represent the percentage who received healthcare within subgroups represented in each row in the subsample with excellent/very good health (e.g., 20.0% of females and 34.9% of males with excellent/very good health reported having received care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who received healthcare within subgroups represented in each row for the subsample with good/fair/poor health (e.g., 56.3% of females and 46.7% of males with good/fair/poor health reported having received healthcare). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= 05 in final model
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S2** Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrants, by self-reported health status

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Usual source of care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Usual source of care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| Predisposing factors | | | | | | |
| Gender | | | | | | |
| • Female | 20.0 | Ref. | -- | 37.5 | Ref. | -- |
| • Male | 31.3 | 1.82 (0.19–17.3) | -- | 46.2 | 1.43 (0.47–4.32) | -- |
| Age | -- | 1.00 (0.95–1.05) | -- | -- | 1.02 (0.98–1.06) | -- |
| Education level | | | | | | |
| • Lower than high school | 32.7 | Ref. | -- | 45.5 | Ref. | -- |
| • Completed high school education | 25.0 | 0.68 (0.21–2.23) | -- | 41.2 | 0.84 (0.29–2.44) | -- |
| Marital status | | | | | | |
| • Single | 31.4 | Ref. | -- | 48.8 | Ref. | -- |
| • Married/cohabiting | 29.4 | 0.91 (0.33–2.54) | -- | 41.5 | 0.75 (0.33–1.69) | -- |
| Most usual employment status last 12 months | | | | | | |
| • Full time employed | 34.0 | Ref. | -- | 41.5 | Ref. | -- |
| • Part time employed | 42.9 | 1.45 (0.29–7.30) | -- | 37.5 | 0.85 (0.18–3.91) | -- |
| • Other | 0.0 | -- | | 50.0 | 1.41 (0.57–3.47) | |

Notes: *$p \le 0.30$ in unadjusted analyses, [a]$p < 0.1$, [b]$p < 0.05$, [c]$p < 0.01$,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the subsample who had excellent/very good health (e.g., 20% of females and 31.3% of males with excellent/very good health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the subsample who reported good/fair/poor health (e.g., 37.5% of females and 46.2% of males with good/fair/poor health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p <= .05$ in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S2** Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrants, by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Usual source of care¹ % | Unadjusted model OR (95% CI) | Adjusted model³ OR (95% CI) | Usual source of care² % | Unadjusted model OR (95% CI) | Adjusted model³ OR (95% CI) |
| **Predisposing factors** | | | | | | |
| Most usual occupation last 12 months | | | | | | |
| • Agriculture/farm | 40.0 | Ref.* | -- | 14.3 | Ref.* | -- |
| • Restaurant/club | 40.0 | 1.00 (0.13–7.89) | | 43.8 | 4.67 (0.45–48.3) | |
| • Factory/industry | 0.0 | -- | | 71.4 | **15.0 (1.03–218)**ᵇ | |
| • Construction | 45.5 | 1.25 (0.26–6.03) | | 28.6 | 2.40 (0.21–26.8) | |
| • Other | 19.4 | 0.36 (0.09–1.41) | | 48.9 | 5.75 (0.64–51.5) | |
| Time spent in the US during lifetime | | | | | | |
| • Less than five years | 22.2 | Ref. | -- | 22.2 | Ref.* | -- |
| • Five to nine years | 21.4 | 0.95 (0.13–7.23) | | 34.8 | 1.87 (0.31–11.2) | |
| • Ten years or more | 31.8 | 1.63 (0.30–8.89) | | 50.8 | 3.62 (0.69–18.8) | |
| Time spent in the US last 12 months | | | | | | |
| • Less than six months | 30.0 | Ref. | -- | 66.7 | Ref. | -- |
| • 6–11 months | 29.3 | 0.97 (0.22–4.19) | | 44.9 | 0.41 (0.04–4.67) | |
| • 12 months | 100.0 | -- | | 0.0 | -- | |
| Level of acculturation based on language scale⁴ | -- | 1.15 (0.86–1.54) | -- | -- | 1.05 (0.85–1.30) | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, ᵃp < 0.1, ᵇp < 0.05, ᶜp < 0.01,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the subsample who had excellent/very good health (e.g., 20% of females and 31.3% of males with excellent/very good health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the subsample who reported good/fair/poor health (e.g., 37.5% of females and 46.2% of males with good/fair/poor health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p ≤ .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S2**    Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrants, by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) — Usual source of care¹ % | Unadjusted model OR (95% CI) | Adjusted model³ OR (95% CI) | Good/fair/poor health status (n = 101) — Usual source of care² % | Unadjusted model OR (95% CI) | Adjusted model³ OR (95% CI) |
|---|---|---|---|---|---|---|
| **Need factors** | | | | | | |
| Injuries/burns⁵ | | | | | | |
| • No | 29.4 | -- | -- | 44.9 | Ref. | -- |
| • Yes | 100.0 | -- | | 40.0 | 0.82 (0.13–5.13) | |
| Health status score⁶ | -- | 1.00 (0.90–1.10) | -- | -- | 0.96 (0.91–1.01)* | -- |
| **Enabling factors** | | | | | | |
| Last entry into the US | | | | | | |
| • Unauthorised | 25.6 | Ref. | -- | 42.9 | Ref. | -- |
| • Authorised | 32.1 | 1.37 (0.47–4.01) | | 47.8 | 1.22 (0.47–3.15) | |
| Return to Mexico was due to deportation | | | | | | |
| • No | 35.5 | Ref. | -- | 45.2 | Ref. | |
| • Yes | 26.3 | 0.65 (0.23–1.82) | | 44.4 | 0.97 (0.41–2.31) | |

Notes: $*p \leq 0.30$ in unadjusted analyses, $^{a}p < 0.1$, $^{b}p < 0.05$, $^{c}p < 0.01$,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the subsample who had excellent/very good health (e.g., 20% of females and 31.3% of males with excellent/very good health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the subsample who reported good/fair/poor health (e.g., 37.5% of females and 46.2% of males with good/fair/poor health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p <= .05$ in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S2** Predisposing, need and enabling factors associated with availability of a usual source of care in the USA among returning Mexican migrants, by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Usual source of care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Usual source of care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Enabling factors** | | | | | | |
| Health insurance | | | | | | |
| • No insurance | 26.8 | Ref.* | Ref. | 30.5 | Ref.* | Ref. |
| • With insurance | 46.2 | 2.34 (0.68–8.10) | 2.34 (0.68–8.10) | 68.6 | **4.97 (2.01–12.3)**[c] | **4.97 (2.01–12.3)**[c] |
| Money earned last 12 months (in thousands) | -- | 0.99 (0.96–1.03) | -- | -- | 1.02 (0.98–1.06) | -- |
| Transportation limitations | | | | | | |
| • No | 32.1 | Ref. | -- | 42.5 | Ref. | -- |
| • Yes | 25.0 | 0.70 (0.17–2.92) | | 52.4 | 1.49 (0.56–3.94) | |
| US state where most time spent | | | | | | |
| • Other states | 62.5 | Ref. | | 54.6 | Ref. | |
| • CA | 26.2 | 0.21 (0.05–1.00)[a] | | 43.4 | 0.63 (0.18–2.26) | |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who had a usual source of care within subgroups represented in each row in the subsample who had excellent/very good health (e.g., 20% of females and 31.3% of males with excellent/very good health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who had a usual source of care within subgroups represented in each row for the subsample who reported good/fair/poor health (e.g., 37.5% of females and 46.2% of males with good/fair/poor health reported having a usual source of care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p < = .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Forgone care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Forgone care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| Predisposing factors | | | | | | |
| Gender | | | | | | |
| • Female | 0.0 | -- | -- | 20.0 | Ref. | -- |
| • Male | 7.0 | | | 12.2 | 0.55 (0.13–2.35) | |
| Age | -- | 1.02 (0.93–1.12) | -- | -- | 1.00 (0.95–1.05) | -- |
| Education level | | | | | | |
| • Lower than high school | 7.0 | Ref. | -- | 13.7 | Ref. | -- |
| • Completed high school education | 5.3 | 0.74 (0.07–7.62) | | 12.5 | 0.90 (0.18–4.57) | |
| Marital status | | | | | | |
| • Single | 9.7 | Ref. | -- | 12.8 | Ref. | -- |
| • Married/cohabiting | 3.2 | 0.31 (0.03–3.17) | | 14.0 | 1.11 (0.32–3.80) | |
| Most usual employment status last 12 months | | | | | | |
| • Full time employed | 7.0 | -- | -- | 11.8 | Ref.* | -- |
| • Part time employed | 0.0 | | | 37.5 | 4.50 (0.85–23.9)[a] | |
| • Other | 0.0 | | | 10.7 | 0.90 (0.21–3.91) | |

Notes: $*p \leq 0.30$ in unadjusted analyses, $^a p < 0.1$, $^b p < 0.05$, $^c p < 0.01$,
[1]Figures represent the percentage who reported forgone care within subgroups represented within subgroups represented in each row in the subsample with excellent/very good health (e.g., 0% of females and 7% of males with excellent/very good health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who reported forgone care within subgroups represented in each row for the subsample with good/fair/poor health (e.g. 20.0% of females and 12.2% of males with good/fair/poor health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p \leq .05$ in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S3** Predisposing, need and enabling factors associated with forgone healthcare in the USA among returning Mexican migrants, by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Forgone care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Forgone care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| Predisposing factors | | | | | | |
| Most usual occupation last 12 months | | | | | | |
| • Agriculture/farm | 0.0 | -- | -- | 0.0 | -- | -- |
| • Restaurant/club | 0.0 | -- | -- | 13.0 | Ref. | -- |
| • Factory/industry | 0.0 | -- | -- | 28.6 | 4.00 (0.45–35.8) | -- |
| • Construction | 20.0 | Ref. | -- | 14.3 | 1.67 (0.21–13.4) | -- |
| • Other | 3.3 | 0.47 (0.04–5.43) | -- | 13.6 | 1.58 (0.29–8.55) | -- |
| Time spent in the US during lifetime | | | | | | |
| • Less than five years | 0.0 | -- | -- | 12.5 | Ref. | -- |
| • Five to nine years | 7.7 | Ref. | -- | 13.6 | 1.11 (0.10–12.5) | -- |
| • Ten years or more | 7.9 | 1.71 (0.17–17.6) | -- | 13.6 | 1.10 (0.12–10.1) | -- |
| Time spent in the US last 12 months | | | | | | |
| • Less than six months | 0.0 | -- | -- | 0.0 | -- | -- |
| • 6–11 months | 7.6 | -- | -- | 13.1 | Ref.* | -- |
| • 12 months | 0.0 | -- | -- | 50.0 | 6.91 (0.40–119) | -- |
| Level of acculturation based on language scale[4] | -- | 1.28 (0.82–1.97)* | -- | | 1.24 (0.92–1.66)* | -- |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who reported forgone care within subgroups represented in each row in the subsample with excellent/very good health (e.g., 0% of females and 7% of males with excellent/very good health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who reported forgone care within subgroups represented in each row for the subsample with good/fair/poor health (e.g. 20.0% of females and 12.2% of males with good/fair/poor health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p < = .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S3**　Predisposing, need and enabling factors associated with forgone healthcare in the USA among returning Mexican migrants, by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Forgone care[1] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) | Forgone care[2] % | Unadjusted model OR (95% CI) | Adjusted model[3] OR (95% CI) |
| **Need factors** | | | | | | |
| Injuries/burns[5] | | | | | | |
| • No | 6.6 | -- | -- | 13.1 | Ref. | -- |
| • Yes | 0.0 | | | 20.0 | 1.66 (0.17–16.2) | |
| Health status score[6] | -- | 0.90 (0.77–1.05)* | -- | -- | **0.89 (0.82–0.96)**\*c | **0.88 (0.81–0.96)**c |
| **Enabling factors** | | | | | | |
| Last entry into the US | | | | | | |
| • Unauthorised | 8.8 | Ref. | -- | 14.7 | Ref. | -- |
| • Authorised | 3.9 | 0.41 (0.04–4.22) | | 9.5 | 0.61 (0.12–3.04) | |
| Return to Mexico was due to deportation | | | | | | |
| • No | 0.0 | -- | -- | 10.0 | Ref. | -- |
| • Yes | 12.5 | | | 15.3 | 1.62 (0.40–6.49) | |

Notes: *p ≤ 0.30 in unadjusted analyses, [a]p < 0.1, [b]p < 0.05, [c]p < 0.01,
[1]Figures represent the percentage who reported forgone care within subgroups represented within subgroups represented in each row in the subsample with excellent/very good health (e.g., 0% of females and 7% of males with excellent/very good health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who reported forgone care within subgroups represented in each row for the subsample with good/fair/poor health (e.g. 20.0% of females and 12.2% of males with good/fair/poor health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates p <= .05 in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

**Table S3** Predisposing, need and enabling factors associated with forgone healthcare in the USA among returning Mexican migrants, by self-reported health status (continued)

| Factors | Excellent/very good health status (n = 72) | | | Good/fair/poor health status (n = 101) | | |
|---|---|---|---|---|---|---|
| | Forgone care¹ % | Unadjusted model OR (95% CI) | Adjusted model³ OR (95% CI) | Forgone care² % | Unadjusted model OR (95% CI) | Adjusted model³ OR (95% CI) |
| **Enabling factors** | | | | | | |
| Health insurance | | | | | | |
| • No insurance | 6.3 | Ref. | -- | 16.7 | Ref.* | -- |
| • With insurance | 7.1 | 1.15 (0.11–12.0) | | 8.6 | 0.47 (0.12–1.87) | |
| Money earned last 12 months (in thousands) | -- | 1.01 (0.94–1.08) | -- | -- | 0.98 (0.94–1.03) | -- |
| Transportation limitations | | | | | | |
| • No | 3.9 | Ref.* | Ref | 10.1 | Ref.* | Ref. |
| • Yes | 22.2 | 7.14 (0.86–59.1)[a] | 7.14 (0.86–59.1)[a] | 25.0 | 2.95 (0.82–10.6)[a] | 3.10 (0.78–12.4) |
| US state where most time spent | | | | | | |
| • Other states | 12.5 | Ref. | | 9.1 | Ref. | |
| • CA | 5.6 | 0.41 (0.04–4.53) | | 14.1 | 1.64 (0.19–14.1) | |

Notes: $*p \leq 0.30$ in unadjusted analyses, $^a p < 0.1$, $^b p < 0.05$, $^c p < 0.01$,
[1]Figures represent the percentage who reported forgone care within subgroups represented in each row in the subsample with excellent/very good health (e.g., 0% of females and 7% of males with excellent/very good health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[2]Figures represent the percentage who reported forgone care within subgroups represented in each row for the subsample with good/fair/poor health (e.g. 20.0% of females and 12.2% of males with good/fair/poor health reported having gone without needed medical care). Percentages are therefore not expected to add up to 100%,
[3]Adjusted odds ratios and 95% CIs based on hierarchical multivariate logistic regression models, using conditional backward stepwise procedures. Only factors retained in the final model are shown in this column. Bold font indicates $p <= .05$ in final model,
[4]On a 0–8 scale, 0 = lowest level of acculturation, 8 = highest level of acculturation,
[5]Self-reported history over the last 12 months,
[6]On a 0–44 scale, 0 = worst health status, 44 = best health status

## 4.5   *Explanatory power of enabling versus predisposing and need factors*

Table 5 shows the estimated variance explained by our logistic regression models before and after adding enabling factors to the models. When using the entire sample, our analysis indicates that enabling factors explain about 6% of the variance found for healthcare utilisation, 9% of the variance in having an available source of care and 6% of the variance in reports of forgone healthcare. Relative to predisposing and need factors, enabling factors increased the amount of variance explained by 63% for healthcare utilisation, 346% for availability of a usual source of care and by 35% for forgone healthcare. For the deported subsample, enabling factors explained between 2% and 18% of variance in healthcare access indicators and, relative to predisposing and need factors, enabling factors increased the amount of variance explained by 22% to 276%. In general, for deported migrants the explanatory power of enabling factors was greatest for healthcare utilisation, followed by having a usual source of care and lowest for forgone healthcare.

**Table 5**     Explanatory power of enabling versus predisposing and need factors*

|  | All migrants (n = 186) | | | Deported migrants ( n= 117) | | |
|---|---|---|---|---|---|---|
|  | Receipt of any healthcare | Usual source of care | Forgone care | Receipt of any healthcare | Usual source of care | Forgone care |
| Predisposing and need factors only ($R^2$) | 0.095 | 0.026 | 0.174 | 0.064 | -- | 0.099 |
| Adding enabling ($R^2$) | 0.155 | 0.116 | 0.235 | 0.241 | 0.111 | 0.121 |
| Increase in $R^2$ after adding enabling factors (absolute) | 0.06 | 0.09 | 0.061 | 0.177 | 0.111 | 0.022 |
| Increase in $R^2$ after adding enabling factors to model (%) | 63.16 | 346.15 | 35.06 | 276.56 | 111.11 | 22.22 |

Note: *$R^2$ estimates are based on correlations between predicted and observed
probabilities in final multivariate logistic regression models with predisposing and
need factors before and after adding enabling factors

## 5   Discussion

This paper examined levels of healthcare access among a probability sample of circular and undocumented Mexican migrants returning to Mexico *via* the city of Tijuana and identified factors associated with various healthcare access indicators, with special emphasis on the role of modifiable, enabling factors. Our study found that only 42% of migrants in our sample reported having received any type of healthcare service in the USA over the previous 12 months. In contrast, data from the 2007 California Health Interview Survey, a telephone population-based study, has shown that 76% of all documented and 57% of all undocumented Mexican migrants (defined as those who were

not citizens or permanent residents) had had at least one doctor visit during the previous year (Bustamante et al., 2012). Our estimates are also in clear contrast with rates of medical provider use in the last 12 months among adults in the USA (75.3%) and even substantially below estimates of healthcare receipt for US adults living in poverty (61.4%) (US Census Bureau, 2013). Contrary to commonplace notions on the role of undocumented immigrants as draining healthcare resources and over relying on emergency room and hospital services, our survey also suggests that emergency room use (13%) is markedly less prevalent among Mexican migrants compared to rates found among US adults, which are estimated to be around 21%. Hospitalisation rates, reported by about 12% among our sample, were only slightly higher than those found in the US population (approximately 9%) (Centers for Diseases Control and Prevention, 2012). In all, these results are in line with those from previous studies refuting the assumption that immigrants disproportionately use more costly healthcare services (Mohanty et al., 2005).

In addition to low levels of healthcare utilisation, our survey provides other evidence suggesting low access to healthcare services among the study population. Availability of a usual source of care is one of the most frequently used indicators of access to healthcare (Aday and Andersen, 1974) and has been linked to the likelihood of receiving preventive services and long-term health outcomes, including better control of chronic conditions (Kim et al., 2012). In our sample, only 38% of migrants reported having had a usual source of care in the USA, compared to 70% of all Latino immigrants (Livingston et al., 2008) and estimates 46%–68% among Mexican migrants in California (Bustamante et al., 2012). Only 29% of migrants in our sample had health insurance coverage in the USA compared to 79% among adults in the USA in 2012 (Cohen and Martinez, 2013). These poor indicators of healthcare access highlight the need for interventions to improve the ability to receive healthcare services, particularly expanding health insurance coverage and establishing a medical home among this segment of Mexican migrants.

This study sheds some light on the sources of healthcare accessed by circular and undocumented migrants in the USA, who are usually not eligible for Medicaid, Medicare, or other state-based health insurance programmes. We found that the majority of migrants that had received health services did so for the last time mostly at outpatient and community clinics and, to a lesser extent, private doctor offices. Our results regarding sources of healthcare, particularly for southbound migrants, are similar to estimates based on the National Health Interview Survey (NHIS) for Mexicans in the USA (National Population Council of the Government of Mexico, 2012). Those estimates indicate that about 62% of Mexicans receive services from clinics or health centres and 30% from private doctor offices. Private practices may offer more assurances of anonymity for unauthorised migrants who want to avoid problems with immigration authorities. However, these services may also be associated with higher expenditures for a population with low-income levels. Future studies should look at the out-of-pocket expenses associated with receipt of services and the perceived quality of the services received by migrants treated in different types of healthcare settings in the USA. In general, these findings also suggest that deported migrants rely on outpatient and community clinics as usual sources of care. In contrast, for southbound migrants, outpatient clinics and private doctor offices are the most frequently reported usual sources of care, with less reliance on community clinics. As the different provisions of the Affordable Care Act (ACA) are implemented over the next years, it will be important to monitor the impact of healthcare reform on rates of healthcare access and the types of healthcare sources accessed by undocumented and circular migrants. Some early reports suggest that some of the

changes in funding associated with ACA, particularly in states who have opted not to expand Medicaid, could result in the reduction of services available to uninsured populations. These reductions could shrink the safety healthcare network available to migrants and other uninsured poor populations (Bernstein, 2012; Roser, 2012; The Kaiser Family Foundation, 2014).

Despite evidence of low levels of healthcare utilisation and limited availability of a usual source of care, reports of forgone healthcare were remarkably low among this sample of migrants and similar to levels estimated for the US population. Approximately, one in ten survey respondents in our survey reported having gone without medical care they or a healthcare provider thought they needed. For comparison, it is estimated that 15% of US adults 18–64 years of age did not receive or delayed seeking medical care due to cost in the past 12 months (Centers for Diseases Control and Prevention, 2012). The relatively low prevalence of forgone care reports may be explained by the younger age structure, male overrepresentation and relatively healthy status of circular and undocumented migrants, compared to US native and more established immigrant populations. For example, in a scale ranging from 0 to 40, where 40 indicates no limitations or symptoms experienced over the last four weeks, we found that the average score among surveyed migrants was 36, suggesting this is a generally healthy population. More favourable predisposing and need factors could explain less of a need for healthcare services and, consequently, low reports of forgone healthcare among circular and undocumented migrants. Alternatively, reports of forgone healthcare could be low due to under diagnosed diseases resulting from lack of access to healthcare services. Future studies including clinical and biological measures, as well as mixed quantitative and qualitative methods, would be necessary to more adequately address this question.

This study suggests the role of predisposing and need factors as determinants of healthcare access among circular and undocumented migrants. For instance, our findings suggest migrants' utilisation of health services and likelihood of experiencing unmet healthcare needs vary by occupation sector. Migrants who worked in the agricultural/farming sector were less likely to report use of health services than those working in manufacturing. In turn, migrants working in manufacturing or construction sectors were more likely to report having forgone healthcare compared to those working on the hospitality sector. Previous studies have documented limited levels of healthcare among migrant farm-workers and in manufacturing (Weigel and Armijos, 2012; Talavera-Garza et al., 2013) and linked these to environmental and workplace structural factors (Hoerster, 2011). Occupational barriers and facilitators of healthcare receipt, especially among migrants working in the farming and manufacturing sectors, need to be better understood and addressed by future interventions.

Consistent with Andersen's (1995) model, our analyses support the role of need factors as determinants of healthcare access and utilisation among Mexican migrants. Health status scores were associated with the likelihood of receiving health services. Specifically, the healthier migrants were, the less likely they were to report having received health services or having gone without needed medical care. Furthermore, rates of healthcare utilisation were substantially lower among those who self-identified as having excellent or very good health compared to those with worse health status (i.e., good, fair, or poor; Tables S1–S3). These findings suggest utilisation of healthcare services among migrants is largely driven by actual health needs.

Most importantly, our survey offers some insights on modifiable enabling factors that may facilitate or impede the timely receipt of appropriate healthcare services in the USA

among the most mobile and undocumented segments of the Mexican migrant population. Specifically, our results underscore the role of health insurance coverage and transportation limitations as influencing access to health services by Mexican migrants, even after accounting for actual health needs. For instance, as shown in supplementary Table 1, among those who had no health insurance, rates of healthcare utilisation were low and very similar for those with excellent or very good health (32%) and for those with good, fair, or poor health (36%). In contrast, for those with health insurance, rates of healthcare utilisation were substantially higher and markedly different for those with self-rated health status that was excellent or very good (43%) versus those with self-reported good, fair, or poor health status (70%). The striking difference between migrants with good, fair, or poor health by health insurance status suggests that the lack of health insurance impedes accessing health services among migrants whose health needs should have motivated greater rates of healthcare utilisation.

Contrary to our hypothesis, the state where migrants had lived did not make a significant difference in the likelihood of accessing health services, having a usual source of care, or going without needed medical care. Specifically, we did not find that living in California made it easier for migrants to access healthcare services compared to other states in the USA, once health insurance and other factors were controlled for. The evidence of equally low levels of access to healthcare in California versus other states is important. California has a more favourable legislative climate and fewer restrictions for undocumented migrants to access public programmes and benefits (National Population Council of the Government of Mexico, 2010). Yet, our data suggest other healthcare barriers remain even in states with friendlier policies towards migrants. The findings would be consistent with a study by Amuedo-Dorantes et al. (2013), which showed that returning Mexican migrants reported similar levels of difficulties accessing health services in the USA regardless of whether they were returning from Arizona (i.e., a state with one of the toughest anti-immigrant legislation) or other US states.

Although the overall amount of variance explained by our models was modest (ranging from 12% to 24%, depending on the healthcare access indicator), enabling factors contributed substantially to the explanatory power of our models. When enabling factors were added, the amount of variance explained increased notably. For example, for having a usual source of care, the variance explained after adding health insurance was about 3.5 times higher. Across health indicators, the absolute increase in explained variance attributable to enabling factors was 6–9% for the entire sample. Enabling factors appeared to have an even more significant role for deportees, particularly for healthcare utilisation and availability of a usual source of care.

This study shows that deported migrants differ from southbound migrants in multiple ways. Deported migrants are younger, more likely to be male and less educated. They have spent more time in the USA, yet they are not more acculturated, based on our English language use scale. Deported migrants are also less healthy and face more barriers to healthcare, including lack of health insurance, unauthorised status and transportation limitations, despite reporting relatively similar income levels. Not surprisingly, forgone care was found to be more prevalent among deported migrants compared to migrants voluntarily heading back to their communities of origin. The almost universal undocumented status of deported migrants, which would have rendered most of them ineligible for public health insurance programmes, could have also deterred them from contacting healthcare providers for fear of deportation (Cavazos-Rehg et al., 2007). In all, these results suggest that deported migrants represent a more socially

vulnerable segment within the larger population of circular and undocumented migrants. The results call for actions to improve levels of access to healthcare among all, but particularly among migrants with a history of, or at risk for, deportation, as this subset has worse health status and experiences significantly more impediments to meet their healthcare needs than other migrants.

The currently proposed immigration reform, with its provisions to offer mechanisms for undocumented migrants to regularise their situation and even a pathway to achieve citizenship, is likely to have an impact on healthcare utilisation and improve access to timely care among a large, socially vulnerable and hidden population. Immigration reform may also include specific provisions to expand currently unauthorised immigrants' access to healthcare (National Immigration Law Center, 2013). In the long term, these policies may contribute to improve the overall health of the Mexican migrant population and translate into a healthier, more productive US labour force.

Consistent with previous studies with Latino immigrants (Zambrana et al., 1999; Brown et al., 2000; Martinez-Donate, in press), our analyses showed a significant association between health insurance and healthcare utilisation and between health insurance and availability of a regular source of care. Furthermore, additional analyses not shown in this paper suggest that availability of a regular source of care may mediate the association between health insurance and utilisation of healthcare services among this sample. When availability of a regular source of care was entered in the model to predict utilisation of healthcare services, health insurance became non-significant and a positive and significant association was found between having a regular source of care and having received healthcare services (overall: AOR = 23.8, 95% CI: 8.7, 65.1, $p < .001$; deported: AOR = 23.7, 95% CI: 6.5, 86.5, $p < .001$; data not shown). These findings underscore the importance of policies and programmes to expand health insurance coverage in order to improve their access to healthcare services in the USA. Implementation of the ACA over the next years has the potential to improve access to quality healthcare services among legal immigrants who qualify for public insurance programmes or can benefit from the expanded private insurance options resulting from provisions included in the new law. However, current legislation is not likely to directly impact circular and undocumented migrants, as these populations are excluded from most of the provisions on this law (National Immigration Law Center, 2013). For instance, most circular and undocumented migrants are unlikely to meet the 'lawfully present' requirement to be eligible for the new affordable coverage options (National Immigration Law Center, 2012). Likewise, participation in health insurance market exchanges requires social security and other job and income information that may not be easy to obtain for unauthorised and/or highly mobile migrants (Obamacare Facts, not dated). Furthermore, changes in funding requirements and increased pressure to serve a larger pool of newly insured patients may indirectly affect the ability of community clinics and other agencies to provide basic preventive and treatment services for largely uninsured temporary and/or undocumented migrants.

A transportation barrier was one of the most important factors associated with forgone healthcare among our sample migrants. This result was consistent with previous research on barriers to healthcare among Mexican migrants (Cristancho et al., 2008). As many as one out of five migrants (and 27% of the deportees) reported having experienced transportation limitations in the USA. Migrants who faced transportation barriers were significantly more likely to have gone without needed healthcare. Similar findings have been reported by previous studies with Latino immigrants in the USA (Guidry, 1997). An

analysis of preventative healthcare visits among Latino children in an urban setting found that 21% of parents cited transportation problems as the single most important reason for not bringing their children in for medical visits (Flores, 1998). A 2004 study using national data found 18% of Latina women delayed care in the past year due to transportation problems, almost four times that of White women (5%) who also reported delaying care because of transportation (The Kaiser Family Foundation, 2004). Collectively, these findings call for programmes aimed to alleviate transportation barriers experienced by Mexican migrants in the USA. Provision of on-site primary care by employers with large numbers of migrant and immigrant employees, funding for mobile clinics and transportation services to and from healthcare systems could help reduce the impact of transportation impediments and reduce rates of forgone care among migrants.

## 5.1 Limitations

This study is subject to several limitations. The response rate was moderately high, but self-selection of eligible individuals into the survey and the restriction of the survey to a single border town (i.e., Tijuana) may still limit the generalisability of the findings. Data were solely based on self-report and potentially subject to recall and social desirability biases. The anonymous nature of the study and use of highly trained and experienced Mexican national interviewers should have increased the validity of the data. Nonetheless, our results may underestimate the prevalence of forgone care due to under-diagnosed disease. The small sample size of this survey has resulted in wide confidence intervals and may have limited statistical power available to detect significant associations between study variables. Future surveys with larger sample sizes are important to confirm the findings from this pilot survey. The cross-sectional design of this study does not allow establishing temporal order of the independent and dependent variables. Finally, circular and deported migrants may be more vulnerable and medically underserved compared to non-circular, non-deported and/or other undocumented Mexican migrants in the USA. For that reason, our findings have to be regarded as possibly restricted to this unique subset of migrants and should not be directly compared to those from other surveys conducted with migrants in the USA. Still, given the large size and mobility of the circular and deported Mexican migrant population, the findings have important implications for future binational policies aimed to increase access to care among this vulnerable transnational population.

## 6 Summary and conclusions

Circular and undocumented Mexican migrants have low levels of access to healthcare in the USA. A number of modifiable factors are associated with healthcare access among this population and suggest opportunities for future policies and programmes aimed to improve the health of this population. In particular, interventions to expand health insurance coverage and reduce transportation barriers are warranted in order to promote timely access to healthcare among circular and undocumented Mexican migrants. In the absence of timely and effective healthcare, mild and/or treatable health problems faced by these individuals may become serious conditions and limit severely their ability to contribute to the US and Mexican economies. In the long run, untreated diseases will translate into greater human suffering and societal costs for both the USA and Mexico.

Expansions of the healthcare reform and immigration policy decisions should be considered against this backdrop and informed by health impact assessments assessing the economic, societal and ethical implications of different policy scenarios.

## Acknowledgements

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## Notes

1    Odds ratios (OR) are measures of association between an independent factor (a.k.a. exposure or predictor) and a dichotomous outcome. They represent the odds that the outcome will be observed given the presence of the factor compared to the odds of the outcome occurring if the factor is absent. For example, the odds of reporting having utilised health care services among migrants with health insurance compared to the odds of reporting having utilised health care services among migrants without health insurance. Mathematically, in a logistic regression model, the OR associated with a one-unit increase in the value of the independent factor is the exponential function (eb) of the regression coefficient for that factor (b). The 95% CI is a measure of the precision of the OR, with decreasing levels of precision indicated by larger CIs. Frequently, 95% CIs are used as proxies for statistical significance when they exclude the null value (OR = 1).