



Brief Original Report

Seasonal influenza vaccination among Mexican migrants traveling through the Mexico–US border region



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ARTICLE INFO

Available online 13 December 2014

Keywords:

Mexican migrants
Health care
Influenza
Vaccination
Border health

ABSTRACT

Objective. Mobile populations are at high risk for communicable diseases and can serve as a bridge between sending and receiving communities. The objective of this study is to determine the rates of, and factors associated with, seasonal influenza vaccination among Mexican migrants traveling through the US–Mexico border.

Methods. We used a 2013 cross-sectional population-based survey of adult mobile Mexican migrants traveling through the Mexico–US border region (N = 2313; weighted N = 652,500). We performed a multivariable logistic regression analysis to model the odds of receiving an influenza vaccination in the past year by sociodemographics, migration history, health status, and access to health care.

Results. The seasonal influenza vaccination rate in this population was 18.6%. Gender, health status, and health insurance were associated with the likelihood to receive an influenza vaccination.

Conclusion. Overall, the rates of seasonal influenza vaccination in circular Mexican migrants are low compared to adults in Mexico and the US. Efforts are needed to increase influenza vaccination among this highly mobile population, particularly in adults with chronic conditions.

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Introduction

Annually, seasonal influenza affects between 5–15% of the global population and it is associated with significant morbidity, mortality, and loss of productivity (World Health Organization, 2003). Communicable diseases, such as seasonal influenza, may present a unique challenge for countries that are sources or receivers of a large mobile population, such as the United States and Mexico (Gushulak and MacPherson, 2004). Circular Mexican migrants, Mexican-born individuals that travel back and forth between the United States (US) and Mexico (Passel et al., 2009), are a particularly unique population in the epidemiology of seasonal influenza for several reasons. They may be at increased risk of developing seasonal influenza and associated morbidity due to socioeconomic status, limited access to health care, living and traveling conditions, and legal status (Steege et al., 2009; Truman et al., 2009). Once they contract the disease, low levels of access to health care may result in greater morbidity (Truman et al., 2009). Employment in the informal sector or in jobs with limited or no sick leave benefits may force migrants to go to work while they are ill, increasing the risk for transmitting the disease to others (Steege et al., 2009). Finally, given their circular migration pattern, they may serve

as a bridge in the transmission of influenza between and within the US and Mexico (Gellert, 1993).

Seasonal influenza vaccination has been proven to be very cost-effective in the prevention of seasonal influenza (Nichol and Treanor, 2006). Both the US and Mexico have placed an importance on monitoring rates of seasonal influenza vaccine uptake (Ropero-Alvarez et al., 2009). Despite this, little is known about the rates of seasonal influenza vaccination among Mexican migrants, the largest migrant population in the US. Research on this and other migrant health issues presents significant challenges due to mobility, geographical dispersion, and unauthorized immigration status (Zuniga et al., 2005). The objective of this study is to determine the rates of, and factors associated with, seasonal influenza vaccination among Mexican migrants circulating through the Mexico–US border, with emphasis on labor and deported migrants.

Methods

Study participants and setting

We used data from a large cross-sectional probability survey of Mexican migrants at key transit points in the Mexican border city of Tijuana, Mexico (N = 2313). The Health Care Access Among Mexican Migrants survey was conducted in 2013 at the San Ysidro/El Chaparral deportation facility, the Tijuana airport, and the central bus station. With the exception of deported migrants, the sampling methods focused on migrants who arrived at or departed from Tijuana using traditional methods of public transportation (air and bus). However, this sampling strategy allowed us to sample migrants that used any method

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Table 1
Rates of seasonal influenza vaccination by sociodemographic characteristics, migration history, health status, and access to health care factors, Tijuana, Mexico, 2013.

	Total (Sample N = 2313) (Weighted N = 652,500) %	Vaccinated (Sample N = 391) (Weighted N = 121,530) %	Not vaccinated (Sample N = 1922) (Weighted N = 530,970) %	p-Value
All	100	18.6	81.4	
Mean age (standard deviation)	42.5 (14.0)	45.8 (14.4)	41.8 (13.8)	< 0.001
Gender				< 0.001
Male	77.1	15.5	84.5	
Female	22.9	27.6	72.4	
Education				0.335
Less than HS	49.0	19.9	80.1	
Greater than HS	51.0	17.4	82.6	
Marital status				0.928
Married	60.6	18.5	81.5	
Not married	39.4	18.8	81.2	
Migration flow				0.245
Southbound	28.4	20.6	79.4	
Deported	5.1	17.4	82.6	
Border	16.5	13.9	86.1	
Northbound	49.9	19.1	80.9	
Health status				0.176
Excellent/very good/good	79.5	17.1	82.9	
Fair/poor	20.5	24.1	75.9	
Adult with chronic condition				< 0.001
No	76.9	13.9	86.1	
Yes	23.1	31.2	68.8	
Health insurance				< 0.001
None	46.8	13.0	87.0	
Mexico	36.8	20.0	80.0	
US public	5.1	37.2	62.8	
US private/other	11.3	24.3	75.7	
Contracted employee				0.994
No	77.6	18.7	81.3	
Yes	22.4	18.7	81.3	

of transportation to traverse the Mexico–US border (including on foot, with the help of a coyote, in a private car). Eligible individuals were defined as those who were at least 18 years old, born in Mexico or other Latin American countries, fluent in Spanish, not Tijuana residents (except for deported migrants), and traveling for labor reasons or change of residence. Using multistage random sampling procedures, survey participants were recruited from four different migration flows: (1) Southbound – individuals who traveled from the US to Mexico voluntarily (2) Deported – individuals returning from the US to Mexico via deportation (3) Border – individuals who arrived in Tijuana from other areas on the Mexican side of the border region (4) Northbound – individuals who traveled to Tijuana from other areas in Mexico with the intention to travel to the US or stay in the border region. These flows represent unique stages in the migration process and are proxy indicators of levels of health care access in different migration contexts: sending communities in Mexico (Northbound flow migrants), the Mexico border region (Border flow migrants), receiving communities in the US (Southbound flow migrants), and correctional/immigration detention settings (Deported flow migrants). Differentiating migrants according to their trajectories allowed us to investigate potential differences in health care access by flow. The overall response rate was 57.9%. The study was approved by the authors' institutional review boards.

Measures

The primary outcome measure for this analysis was self-reported receipt of seasonal influenza vaccination in the past 12 months. Additional measures used in this study included sociodemographic characteristics (age, gender, educational attainment, marital status), migration history (migration flow), health status (self-reported health, any chronic condition) and access to care (health insurance status, being a contracted employee).

Statistical analysis

We calculated the rates of self-reported seasonal influenza vaccination during the prior 12 months. We used multivariable logistic regression to model the odds of receipt of seasonal influenza vaccination, by sociodemographic,

migration flow, health status, and access to health care factors. Survey weights were used to account for the complex sampling design and refusals. Survey weighting procedures have been described elsewhere (Amuedo-Dorantes et al., 2013).

Results

The seasonal influenza vaccination rate in the overall sample was 18.6% (Table 1). The unadjusted rates of seasonal influenza vaccination differed by age, gender, chronic health condition, and insurance status.

In the multivariable regression model, females, individuals with a chronic condition, and individuals who had health insurance in the past year were significantly more likely to receive an influenza vaccination compared to male migrants, migrants not diagnosed with a chronic condition, or uninsured, respectively (Table 2).

Discussion

We found that less than 20% of mobile Mexican migrants had received an influenza vaccination in the past year. This estimate is substantially low compared to the overall rates in adults residing in the United States (42%) (Santibanez et al., 2013) and Mexico (44%) (Secretaria de Salud, 2007) as well as the 80% coverage goal set by Healthy People 2020 (Koh, 2010). In part this could be due to the difference in current vaccine guidelines between the US and Mexico. However, both countries emphasize the need for seasonal influenza vaccination in people who are at high risk for complications such as individuals with chronic health conditions and elderly adults (Centers for Disease Control Prevention, 2013; Secretaria de Salud, 2010). Despite this focus on high-risk adults in guidelines, only 31.2% of migrants with a chronic condition and only 28.4% of those over the age of 60 (data not shown) were estimated to have received a seasonal influenza vaccination in our study. These results suggest suboptimal

Table 2
Multivariable logistic regression modeling the odds of seasonal influenza vaccination among Mexican migrants (N = 2313), Tijuana, Mexico, 2013.

	AOR	95% CI
Age	1.01	(1.00–1.02)
Gender		
Male	Reference	
Female	1.73	(1.20–2.48)
Education		
Less than HS	1.22	(0.77–1.91)
Greater than HS	Reference	
Marital status		
Married	Reference	
Not married	1.04	(0.73–1.49)
Migration flow		
Southbound	Reference	
Deported	1.41	(0.81–2.46)
Border	0.68	(0.37–1.26)
Northbound	0.88	(0.53–1.46)
Health status		
Excellent–good	Reference	
Fair/poor	0.93	(0.60–1.44)
Adult with chronic condition		
No	Reference	
Yes	2.46	(1.73–3.48)
Health insurance status		
Uninsured	Reference	
Mexico	1.95	(1.13–3.35)
US public	2.95	(1.56–5.55)
US private	2.15	(1.03–4.51)
Contracted employee		
Yes	1.13	(0.69–1.83)
No	Reference	

Bold values indicate significance at $p < .05$.

vaccination rates even for mobile populations who are highly vulnerable to influenza and are considered as high priority for vaccination in both the US and Mexico.

The rates of seasonal influenza vaccination varied by migration flow with the Southbound flow having the highest levels (20.6%) and the Border flow having the lowest levels (13.9%), however these differences were not statistically significant. Interestingly, even individuals in the Deported flow did not receive seasonal influenza vaccination significantly less than the other flows, despite the potential social vulnerability of individuals in this flow. A lack of difference between migration flows coupled with the consistently low rates of seasonal influenza vaccination seen in all flows suggests that all migrants, regardless of recent migration context, experience reduced access to preventive health care services and could benefit from vaccination campaigns targeting mobile populations in sending, receiving, and transit communities.

Individuals with health insurance (both US and Mexico based insurance) were significantly more likely to receive a seasonal influenza vaccination. This is consistent with research examining factors associated with health care utilization among circular Mexican migrants (Martínez-Donate et al., 2014). Over 50% of adults in the sample did not have any form of health insurance, well above the rates of uninsured adults living in Mexico or the United States (Adams et al., 2011; Gutiérrez et al., 2012). Low insurance rates suggest migrants who contract influenza will also face barriers to receive treatment for complications arising from this disease, making it crucial to intensify vaccination efforts to prevent infection among this medically underserved population.

Strategies to increase vaccine uptake among Mexican migrants in this difficult to reach population need to be further explored (Vlahov et al., 2007). Binational efforts that move beyond surveillance and towards primary prevention need to be addressed (Weinberg et al., 2003). One strategy could include providing seasonal influenza vaccination at transit points, such as immigration facilities and transportation venues, in border towns along the Mexican border region. Most Mexican migrants circulate through these points as they move between the

two countries voluntarily or forced by deportation. Provision of influenza vaccine to migrants at these points could prove effective to reach large numbers of migrants and protect not only their health but also the health of the sending and receiving communities they connect. In addition, binational and bilingual public health messaging and resources targeted at this population may increase awareness among migrants of the importance of receiving seasonal influenza vaccination. Given the transnational nature of this population, both the US and Mexico should collaborate on these efforts.

This analysis has several limitations. First, receipt of seasonal influenza vaccination was self-reported, which may be problematic in a population with potentially low levels of health literacy. Although this method has demonstrated high validity for the assessment of seasonal influenza vaccination rates (Zimmerman et al., 2003), respondents may have mistakenly reported flu vaccination when, in reality, they received other vaccines (e.g. pneumococcal vaccine). This could have resulted in an overestimation of seasonal influenza vaccination rates among this population. Second, our sampling strategy fails to capture migrants that arrive in or depart from Tijuana outside of traditional forms of public transportation (such as by private car) and migrants who travel between sending and receiving communities directly by air. Migrant children, indigenous migrants not fluent in Spanish, and individuals traveling for non-labor reasons (e.g. visiting, shopping, tourism) for short periods of time are also excluded. Exclusion of these individuals may influence vaccination rates. Third, moderate response rates to the survey may have resulted in self-selection in our sample. Information on reasons for refusal was not collected, but interviewers perceived the primary barrier to response was individuals not having the time to complete the survey and wanting to move along to their travel itinerary. In additional analyses, we found that marital status, migrant flow, and interviewer gender were significantly associated with the likelihood of participating in the survey (data not shown). However, these variables were not significant predictors of vaccination in our final model, suggesting that the risk of self-selection bias is low. Despite these limitations, our unique sampling strategy allows for novel estimates of receipt of influenza vaccination in this understudied and vulnerable population.

Conclusion

Rates of seasonal influenza vaccination in circular Mexican migrants are unacceptably low, underscoring the need for binational efforts to increase influenza vaccination among this highly mobile population.

Conflict of interest statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Acknowledgments

Research reported in this publication was supported by the Eunice Kennedy Shriver National Institute of Child Health & Human Development of the National Institutes of Health under award number R01HD046886 (PI: Martínez-Donate). Additional support was provided by the Institute for Clinical and Translational Research – NIH/National Center for Advancing Translational Sciences (NCATS) grants UL1TR000427 [PI: Drezner] and 144 PRJ83HX [PI: Drezner], the University of Wisconsin Madison Medical Scientist Training Program T32GM008692 [PI: Huttenlocher], and the Center for Demography and Ecology at the University of Wisconsin-Madison (P2C HD047873).

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