



HHS Public Access

Author manuscript

Rev Panam Salud Publica. Author manuscript; available in PMC 2015 September 23.

Published in final edited form as:

Rev Panam Salud Publica. 2015 February ; 37(2): 76–82.

Obstetric emergencies at the United States–Mexico border crossings in El Paso, Texas

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Abstract

Objective—To describe the frequency, characteristics, and patient outcomes for women who accessed Emergency Medical Services (EMS) for obstetric emergencies at the ports of entry (POE) between El Paso, Texas, United States of America, and Ciudad Juárez, Chihuahua, Mexico.

Methods—A descriptive study of women 12–49 years of age for whom an EMS ambulance was called to an El Paso POE location from December 2008–April 2011 was conducted. Women were identified through surveillance of EMS records. EMS and emergency department (ED) records were abstracted for all women through December 2009 and for women with an obstetric emergency through April 2011. For obstetric patients admitted to the hospital, additional prenatal and birth characteristics were collected. Frequencies and proportions were estimated for each variable; differences between residents of the United States and Mexico were tested.

Results—During December 2008–December 2009, 47.6% (68/143) of women receiving EMS assistance at an El Paso POE had an obstetric emergency, nearly 20 times the proportion for Texas overall. During December 2008–April 2011, 60.1% (66/109) of obstetric patients with ED records were admitted to hospital and 52 gave birth before discharge. Preterm birth (23.1%; No. = 12), low birth weight (9.6%; No. = 5), birth in transit (7.7%; No. = 4), and postpartum hemorrhage (5.8%; No. = 3) were common; fewer than one-half the women (46.2%; No. = 24) had evidence of prenatal care.

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Conflicts of interest. None.

Conclusions—The high proportion of obstetric EMS transports and high prevalence of complications in this population suggest a need for binational risk reduction efforts.

Keywords

Border areas; border health; pregnancy complications; emergency medical services; international cooperation; maternal welfare; Mexico; United States

The United States of America and Mexico (US-Mexico) border area, defined in 1983 as extending 100 kilometers north and south of the international boundary line and running from the Gulf of Mexico to the Pacific Ocean (1), has been a major focus in the political debate on undocumented immigration, national security, and disparities in health care access (2, 3). Nearly 15 million people reside in the area, including approximately 3 million women of reproductive age (4). For many, country of residence is not country of citizenship: some United States citizens reside in Mexico, some Mexican citizens reside in the United States, and some families maintain residences on both sides of the border (5, 6). Crossing the border in either direction for social, economic, and health care reasons is common among border residents (5–11). Moreover, between the United States and Mexico, there are 52 land ports of entry (POEs) where close to 1 million drivers, passengers, and pedestrians enter the United States legally every day (12).

Among women travelling through POEs, some are seeking obstetrical care from physicians and hospitals in the United States (5, 8, 13). Some women who cross the border in active labor, or with other obstetrical emergencies, require emergency medical services (EMS) transport to a United States hospital. In instances where such women arrive at a POE without the required documentation to enter the United States, “humanitarian parole” may be granted and an EMS transport, including transfer from a Mexican to a United States ambulance, can be arranged by Customs and Border Protection agents (14). EMS transport of obstetrical patients with or without documentation into the United States at POEs in Texas and New Mexico occurs regularly.⁵ The frequency of EMS transports for obstetrical emergencies from US-Mexico border POEs, however, is unknown.

Such events present a number of public health challenges. Late or no prenatal care is common in the border area and in Texas border counties, in particular (15), so some of these women might present to hospitals in the United States with unknown prenatal histories. In addition, women might have surgical deliveries, and then return home with uncertain follow-up. A lack of binational mechanisms to share patient information, including medical records, across the US-Mexico border makes continuity of pre- and post-pregnancy care for women travelling to the United States from Mexico difficult.

⁵Unpublished Protocol to Regulate Temporary Admittance into the United States of Non-US Residents and Non-US Citizens through the Columbus, New Mexico Port of Entry to Obtain Emergency Healthcare Services (2011), New Mexico State Department of Health, Office of Border Health, Las Cruces, New Mexico, United States; personal communication with: C. Wright, former Customs and Border Protection Assistant Port Director in Presidio, Texas and Port Director in Columbus, New Mexico and Santa Teresa, New Mexico (19 June 2013); and personal communication with P. Dulin, former Director of the Office of Border Health, New Mexico Department of Health, Las Cruces, New Mexico (24 May 2013).

The frequency of obstetric emergencies among EMS transports at POEs in El Paso, Texas, (bordering Ciudad Juarez, Mexico) to hospitals in El Paso were identified from a database of EMS transport response records. In addition, the characteristics and birth outcomes of transported women were recorded. Such information could inform efforts to enhance continuity of care and reduce use of EMS transport for obstetric conditions in this binational metropolis.

MATERIALS AND METHODS

This was a descriptive study that employed a database of emergency medical transport response records for women of reproductive age using FirstWatch[®] (Stout Solutions LLC, Encinitas, California, United States), a novel, web-based, commercially available surveillance software system used by the Centers for Disease Control and Prevention's (CDC) El Paso Quarantine Station. The original purpose of the CDC system was to identify reportable diseases, such as tuberculosis, and improve disease surveillance at the El Paso, Texas POEs (16).

Study population

The study population included all women 12–49 years of age who accessed EMS transport from one of the three urban POEs connecting El Paso, Texas, and Ciudad Juarez, Mexico, for any reason, from 1 December 2008–31 December 2009. Information for all women during this time was collected to assess the proportion of transports that were obstetric in nature, and to make comparisons with other populations. To increase the number of obstetrical patients in the study population, all pregnant or postpartum women 12–49 years of age who accessed EMS transport from an El Paso POE for any health emergency from 1 January 2010–30 April 2011 were also assessed. An EMS transport from a POE was defined as one initiated at a POE address. In instances where the address fell outside the POE, but the EMS record narrative clearly stated that the patient had crossed into the United States immediately prior to the incident call, non-POE addresses were also included. Women were included in the study regardless of whether transport to an area hospital was accepted or declined.

Data collection

From each response record, the following data were abstracted: date of EMS call; primary reason for the call as assessed by the EMS responder; patient name, age, and country of residence; and hospital destination. Using date, patient name, and hospital destination from the EMS transport records, patient medical records were requested from the eight nearby El Paso hospitals to which patients were transported. Records that could not be located after three requests were classified as missing. A standard abstraction form and coding reference manual were developed to ensure a systematic approach to data abstraction and coding. The manual included variables of interest from the EMS transport record, the hospital emergency department (ED) record, the labor and delivery (L&D) record, and coding directions for each.

Data abstraction was completed by a team of four individuals that included two physicians. All were trained in the study protocol. Variables abstracted from ED and L&D records included country of residence, admission and discharge diagnoses, disposition from the ED, method of payment, prenatal care (yes/no), prenatal care country (United States/Mexico), method of delivery, birth outcome, and any maternal or delivery complications and adverse outcomes noted.

For comparison purposes, public use EMS data for women 12–49 years of age from the State of Texas for 2009 (17) and comparable data for the City of El Paso for 2011 were obtained. These were the first years that user-friendly electronic data became available, respectively (18). For each population, the proportion of transports attributable to obstetric emergencies was computed.

Study ethics

EMS records were accessed through a secure, password-protected website, and data from medical records were abstracted on-site at hospitals. Precautions to insure patient anonymity were followed and no personal identifiers were included in the analysis file. The study protocol was reviewed for human subjects concerns by the CDC and found to be consistent with public health practice.

Data analysis

The data were analyzed using Epi Info,TM version 3.5.4 (Centers for Disease Control and Prevention, Atlanta, Georgia, United States). Frequencies and proportions of calls for EMS transport at El Paso POEs for each variable were computed. Fisher's exact test was used to test for differences between United States and Mexican residents and the proportions of obstetrical cases at El Paso POEs, the City of El Paso, and the state of Texas.

RESULTS

During December 2008–December 2009, EMS transport response records were identified for 143 women 12–49 years of age who had crossed into the United States at an El Paso POE (Table 1).

Ten women refused transport, electing instead to use their own transportation, and 133 were carried to an El Paso hospital. Most women (57.4%; 82/143) were under 25 years of age. Among the 127 women who reported country of residence, nearly 80% (No. = 101) resided in the United States, and the remainder, in Mexico (No. = 26). Most sought care for acute illnesses or injuries, but the most common single reason for requesting an EMS transport among these women of reproductive age was an obstetric emergency. Almost half (47.6%; 68/143) of the EMS calls from an El Paso POE were obstetric-related. The corresponding proportions in Texas in 2009 (18) and the City of El Paso in 2011 (19) were lower at 2.8% and 5.0%, respectively ($P < 1 \times 10^{-7}$) (Table 2).

A total of 154 women with obstetric conditions during December 2008–April 2011, of whom one-third were adolescents (52/154), requested EMS assistance from an El Paso POE (Table 3). The primary reason for the call, according to EMS response records, was labor.

EMS records indicated that 6 of the 154 women (3.9%) refused EMS ambulance transport to a hospital. Hospital records for 5 of these 6 women, plus 40 others who were transported by EMS ambulance, could not be located. Among the 109 women with obstetric conditions for whom paper or electronic hospital records were located, 62 were admitted to hospital L&D services and 4 were admitted to other services, such as 3 to surgery for ectopic pregnancy or post-partum complications. Of all, 40 women were discharged from the ED and 3 left against medical advice. In general, women residing in the United States were older, less likely to be in active labor, and more likely to be discharged home from the hospital ED than Mexican women ($P < 0.05$).

Fifty-two women among the 62 admitted to L&D services gave birth before discharge, including 36 of the 45 United States residents and 16 of the 17 Mexican residents (Table 4.) According to hospital records, more than one-half of the women had had no prenatal care. Among women who received prenatal care, United States residents were more likely than Mexican residents to have received care in the United States. Most United States residents were either covered by Medicaid (41.7%) or classified as self-pay (36.1%). Most Mexican women were classified as self-pay (56.3%). The proportions of United States and Mexican women who delivered vaginally were similar. Among the vaginal births, 4 were delivered en route (7.7% overall). Other maternal or delivery complications noted were comorbidities in 6 women, postpartum hemorrhage in 3, and breech delivery in 2. Major adverse birth outcomes included 1 stillbirth, 12 preterm live-births ranging from 23 to 36 weeks of gestation (23.1%), 6 live-born infants weighing < 2500 grams (9.6%), and 2 infants with major birth defects.

DISCUSSION

During a period of 28 months, our analyses indicated that EMS ambulances transported 154 women who had crossed into the United States at an El Paso POE to a hospital for obstetric care. About one-third (52/154) of these women were admitted directly to a hospital and delivered a baby. Most (36/52) of these women reported United States residency; 16 reported residency in Mexico. These 52 births constituted < 0.2% of all births in El Paso County during this time period (19).

The proportion of obstetric emergencies requiring EMS transport from an El Paso POE was more than 10-fold the proportion among women of reproductive age using EMS services in the City of El Paso or in Texas overall. Possible explanations for this finding may include a tendency for POE staff to call EMS when a traveler is in active labor (14), for United States citizens and legal permanent residents living in Mexico to return to the United States to give birth, and for Mexican nationals to enter the United States so that their child will be entitled to citizenship (13). Delivering an infant in the United States automatically confers United States citizenship to the child and might provide access to better care for mother and newborn (13). Infants delivered in Mexico to United States citizens residing in Mexico are eligible for United States citizenship, but the process may be time-consuming and involves additional costs (20).

The population of women crossing the border and giving birth appears to be less likely to have received prenatal care than other women in the border area. A recent study of birth certificates from Mexico and the United States found that 10%–17% of women who reside in the border area of Chihuahua and Texas, respectively, received late or no prenatal care during pregnancy (15); whereas, over one-half of our study population was noted to not have had prenatal care. However, prevalence of prenatal care in the medical record might be underestimated if received in health centers unaffiliated with the hospital of birth (13), or in Mexico. Indeed, our study abstractors noted several instances of reports of pre-natal care received in Mexico or prenatal care records in Spanish that were not recognized in the admissions summary of the hospital record. Prevalence of prenatal care might also be low due to lack of insurance (13). The proportion of births to United States residents enrolled in Medicaid (41.7%) appears lower than the percent among all births in Texas in 2011 (56.4%) (21), and few United States residents had private insurance. Lack of prenatal care in this EMS population may reflect a local population that is poor, relative to Texas overall (22), and that resides part-time in Mexico because of its lower cost of living (6).

Over 60% of study women for whom hospital records were located were admitted to the hospital directly from the ED. This proportion is 2–3 times higher than those reported for general EMS transports in other studies (23, 24), and suggests that EMS assistance was justified. Further evidence of the need for urgent obstetric care is indicated by the nearly 8% of deliveries that occurred in transit, which greatly exceeds the incidence of unintended out-of-hospital deliveries reported in other developed countries, which range from 0.1%–2% (25). Anecdotal reports of birth at POEs are consistent with this finding, such as an adolescent United States resident who recently gave birth prematurely in a POE inspection area while awaiting an ambulance (26). Such deliveries also signal that women may be waiting too long to request EMS assistance. Preterm labor was common in this population, resulting in preterm birth among 23.1% of women as compared to 12.2% and 6.2% of births among Hispanic United States residents and Mexican women, respectively, living on either side of the border area (15). The prevalence of low birth weight also appears high in comparison to births among Hispanic United States and Mexican women in the area (15).

In addition to demonstrating the need for EMS transport, the complications among this study population indicate a need for postpartum care and continued follow-up. Although many women were discharged from L&D with instructions to obtain follow-up from their private physician, lack of insurance coverage among many of these transborder women may make it difficult. Notes in the discharge summaries of patient records from the one public hospital in our study acknowledged this difficulty by frequently advising women to make a postnatal appointment, but at the same time warning that access to the clinic cannot be guaranteed. The extent to which women in the study population do obtain postnatal follow-up is unknown.

Hospital records were missing for 45/154 (29%) women with obstetric emergencies. This proportion is consistent with that of an earlier study of missing hospital records (27), which concluded that records for medically-complicated births were less likely to be found in retrospective record ascertainment. In a recent study of missing clinical information from primary care clinics in Colorado (United States), new patients, recent immigrants, and

patients who had multiple medical problems had a higher probability of incomplete clinic records than other patients (28). The absence of hospital records for patients with obstetric emergencies in our study makes the delivery of care after discharge more difficult. This is particularly true for women who return to Mexico following their hospital stays.

Limitations

This study has several limitations. First, the accuracy of self-reported information about country of residence in the EMS and hospital records cannot be confirmed. As a result, the relative proportions of women who report residing in the United States versus Mexico may not be accurate. Second, small numbers of study patients limited a more detailed examination of the characteristics of this population. Third, the absence of hospital records for 29.2% of EMS obstetric patients means that the results shown in Table 4 might not be representative. Fourth, we collected only 13 months of call data for all EMS patients. If the composition of the EMS transport group changed during the subsequent 16 months of the study, the proportion of obstetric calls could have changed and a bias could have been introduced. However, we continued to collect data for obstetric calls only during the latter period of the study, solely to maximize the reach of our resources and have no reason to suspect that the pattern of EMS needs at El Paso POEs changed during those 16 months. Finally, results of this study might not be generalizable to other US-Mexico border POEs. At POEs in more rural border communities, for example, pregnant women can expect an ambulance ride of 1.5 hours or more before reaching a birthing hospital.⁶

Addressing these limitations will require better data on country of residence, more complete medical records, and similar assessments in other border communities.

Recommendations

To improve data quality and help focus risk reduction efforts among this and similar transborder populations, collaborative evaluation of critical health care services and provision of tools to facilitate care on both sides of the border are needed. Binational health councils that operate along the US-Mexico border to call attention to shared health priorities could advocate for improved communication and other changes that would improve birth safety in the border area (29). Such efforts might include the availability of a bilingual prenatal record or a mobile patient record (30), including expected delivery date, blood type, and maternal risk factors that an expectant mother could carry with her. Identification of specific clinics in Mexico that might agree to provide the first postpartum visit and to receive the United States hospital records is also possible. “Promotoras” (community health workers) working in the United States and Mexico could also be engaged to ensure that transborder women receive appropriate postnatal care; binational discussion groups with providers could be conducted on how these linkages could be implemented. These and other approaches to binational sharing of vital clinical information and provision of obstetric services, whatever the motivation for crossing the border, are warranted. The process of border crossing, and in some cases, a long delay before reaching the hospital, coupled with

⁶Personal communications with C. Wright, former Customs and Border Protection Assistant Port Director in Presidio, Texas, and Port Director in Columbus, New Mexico and Santa Teresa, New Mexico (19 June 2013).

the absence of medical records and uncertain follow-up care, likely put both mother and baby at greater risk.

Conclusions

Almost one-half of all EMS calls for women of reproductive age crossing from Ciudad Juarez, Mexico, to El Paso, Texas, were obstetric-related. These were high-risk women. Among them, one-third were adolescents; among the live births, one-quarter were preterm. The high proportion of obstetric EMS transports and high prevalence of complications in this population suggest a need for binational risk reduction efforts.

Acknowledgments

The findings and conclusions in this manuscript are those of the authors and do not necessarily represent the official position of the CDC.

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TABLE 1

Age, country of residence, and primary reason for Emergency Medical Services (EMS) call to El Paso, Texas ports of entry among women 12–49 years of age, December 2008–December 2009

	No.	%
Age (years)		
< 20	42	29.4
20–24	40	28.0
25–34	26	18.2
35	35	24.5
Country of residence		
United States	101	70.6
Mexico	26	18.2
Unknown	16	11.2
Primary reason for EMS call		
Obstetrical	68	47.6
Motor Vehicle Accident (MVA)	20	14.0
Trauma, non-MVA	12	8.4
Abdominal pain	11	7.7
Respiratory distress	6	4.2
Altered mental status	6	4.2
Seizure	3	2.1
Weakness	3	2.1
Other	14	9.8
Total	143	100.0

TABLE 2

Proportions of Emergency Medical Services (EMS) obstetric transport calls to El Paso, Texas land ports of entry (POE), the City of El Paso, and the state of Texas, among women 12–49 years of age, December 2008–December 2009

Location	Number of transports	% Obstetric transports	<i>P</i> value ^a
El Paso POE	143	47.6	
City of El Paso ^b	5 312	5.0	< 0.0000001
State of Texas ^c	203 356	2.8	< 0.0000001

^aSignificant difference at $P < 0.05$ level (Fisher Exact Test).

^bCity of El Paso, EMS transports, 2011.

^cState of Texas, EMS transports, 2009.

TABLE 3

Age, obstetric condition, and disposition from El Paso, Texas, hospital emergency departments (ED) by country of residence among obstetrical Emergency Medical Services (EMS) patients 12–49 years of age, December 2008–December 2011

	United States residence		Mexico residence		Unknown residence		Total	
	No.	%	No.	%	No.	%	No.	%
Age (years)								
<20	35	30.7	14	45.2	3	33.3	52	33.8
20–24	53	46.5	8	25.8 ^a	3	33.3	64	41.6
25–34	18	15.8	7	22.6	3	33.3	28	18.2
35	8	7.0	2	6.5	0	0.0	10	6.5
Primary reason for call, based on the EMS record								
Labor	56	49.1	21	67.7 ^a	4	44.4	81	52.6
Vaginal bleeding	23	20.2	3	9.7	1	11.1	27	17.5
Pain/cramping	20	17.5	5	16.1	1	11.1	26	16.9
Pregnant with other condition ^b	9	7.9	1	3.2	2	22.2	12	7.8
Postpartum complication ^c	3	2.6	1	3.2	1	11.1	5	3.2
Ectopic pregnancy	2	1.8	0	0.0	0	0.0	2	1.3
Spontaneous abortion	1	0.9	0	0.0	0	0.0	1	0.6
Disposition from the ED								
Admitted to labor and delivery	45	39.5	17	54.8	0	0.0	62	40.2
Admitted to other service	4	3.5	0	0.0	0	0.0	4	2.6
Discharged from ED	35	30.7	3	9.7 ^a	2	22.2	40	26.0
Left ED against medical advice	2	1.8	1	3.2	0	0.0	3	1.9
Missing hospital record	28	24.6	10	32.3	7	77.8	45	29.2
Total	114	100.0	31	100.0	9	100.0	154	100.0

^a Significant difference at $P < 0.05$ level, as compared to United States residents (Fisher Exact Test).

^b Includes falls and other trauma (4 cases), faintness/dizziness/headache (2 cases), acute febrile illness (1 case), seizure (1 case), weakness (1 case), diabetic emergency (1 case), post-gallstone surgery pain (1 case), and vomiting with blood (1 case).

^c Includes post-Cesarean pain (2 cases), postpartum abdominal pain (2 cases) and post-ectopic pregnancy complication (1 case).

Prenatal care, form of payment, method of delivery, selected complications, and adverse outcomes among admitted Emergency Medical Services (EMS) obstetric transport patients who gave birth, by country of residence, December 2008–April 2011

TABLE 4

	United States residents (n = 36)		Mexico residents (n = 16)		Total (n = 52)	
	No.	%	No.	%	No.	%
Prenatal care						
Yes	18	50.0	6	37.5	24	46.2
No	17	47.2	10	62.5	27	51.9
Not specified	1	2.8	0	0.0	1	1.9
Place of prenatal care ^b						
United States	11	30.6	0	0.0 ^a	11	21.2
Mexico	2	5.5	6	37.5	8	15.4
Not specified	5	13.9	0	0.0	5	9.6
Form of payment						
Medicaid	15	41.7	0	0.0 ^a	15	28.8
Self-pay	13	36.1	9	56.3	22	42.3
Private/other insurance	2	5.6	4	25.0	6	11.5
Not specified	6	16.7	3	18.8	9	17.3
Method of delivery						
Vaginal	30	83.3	14	87.5	44	84.6
Cesarean	6	16.7	2	12.5	8	15.4
Selected maternal and delivery complications						
Comorbidities ^c	6	16.7	0	0.0	6	11.5
Hemorrhage	1	2.8	2	12.5	3	5.8
Breech birth	2	5.6	0	0.0	2	3.8
Delivered in transit ^d	4	11.1	0	0.0	4	7.7
Adverse infant outcomes						
Stillbirth	1	2.8	0	0.0	1	1.9
Preterm live birth	8	22.2	4	25.0	12	23.1
Birth weight < 2500 grams	3	8.3	2	12.5	5	9.6
Major birth defects	1	2.8	1	6.3	2	3.8

	<u>United States residents (n = 36)</u>		<u>Mexico residents (n = 16)</u>		<u>Total (n = 52)</u>	
	No.	%	No.	%	No.	%
Total	36	100.0	16	100.0	52	100.0

^a Significant difference at $P < 0.05$ level, as compared to United States residents (Fisher Exact Test).

^b Among the 24 women with prenatal care.

^c Includes sexually transmitted disease (2 cases), other infection (2 cases), anemia (1 case) and anemia and asthma (1 case).

^d Includes deliveries in ambulance (3 patients) and at hospital elevator (1 patient).