

表 4 (2013 年). 2013 年における外国人患者の薬物乱用・性行動と血清学的検査の結果
 [単位：百分率 (括弧内に実人数を示す)]

	男性	女性	合計
薬物	19.2(5/26)	12.5(2/16)	16.7(7/42)
静脈	0(0/26)	0 (0/16)	0(0/42)
風俗	15.4 (4/26)	18.8 (3/16)	16.7(7/42)
不特定多数	15.4 (4/26)	12.5(2/16)	14.3(6/42)
同性愛	11.5 (3/26)	6.3 (1/16)	9.5(4/42)
HIV	0(0/26)	0 (0/16)	0(0/42)
HCV	7.7(2/26)	0 (0/16)	4.8(2/42)
HBsAg	3.8 (1/26)	0(0/16)	2.4(1/42)
HBsAb	0(0/26)	0 (0/16)	0(0/42)
TPHA	0(0/26)	0 (0/16)	0(0/42)

表 1 (2014 年). 2014 年における外国人入院患者の国籍 [単位：人数]

国籍	男	女	合計
中国	6	7	13
韓国	3	5	8
フィリピン	0	5	5
アメリカ合衆国	4	0	4
フランス	4	0	4
アイルランド	3	0	3
ナイジェリア	3	0	3
台湾	0	3	3
イギリス	2	0	2
オーストラリア	2	0	2
ドイツ	1	1	2
北朝鮮	0	2	2
タイ	0	2	2
ベトナム	0	2	2
アフガニスタン	1	0	1
エジプト	1	0	1
ガーナ	1	0	1
カナダ	1	0	1
コートジボワール	1	0	1
シンガポール	1	0	1
スロバキア	1	0	1
ブラジル	1	0	1
ニュージーランド	1	0	1
ネパール	1	0	1
バングラデシュ	1	0	1
ブラジル	1	0	1
モロッコ	1	0	1
インド	0	1	1
チリ	0	1	1
ノルウェー	0	1	1
メキシコ	0	1	1
モンゴル	0	1	1
合計	41	33	74

表 2 (2014 年). 2014 年における外国人入院患者の有する感染症 [単位: 人数]

	HBsAg	HBsAb	HCVAb	TPHA	RPR	HIVAb	HIV-WB
男(41名)	3 7.3%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%	0 0.0%
女(33名)	2 6.1%	0 0.0%	0 0.0%	1 3.0%	0 0.0%	0 0.0%	0 0.0%
合計(74名)	5 6.8%	0 0.0%	0 0.0%	1 1.4%	0 0.0%	0 0.0%	0 0.0%

表 3 (2014 年). 2014 年における外国人患者の ICD-10 分類 [単位: 人数]

ICD-10	男性	女性	合計
F0 (認知症・器質性疾患)	2	1	3
F1 (精神作用物質性障害)	10	5	15
アルコール	(6)	(1)	(7)
覚醒剤	(4)	(2)	(6)
F2 (統合失調症など)	28	25	53
F3 (躁鬱病圏)	1	1	2
その他	0	1	1
合計	41	33	74

表 4 (2014 年). 2014 年における外国人患者の薬物乱用・性行動と血清学的検査の結果
[単位: 百分率 (括弧内に実人数を示す)]

	男性	女性	合計
薬物使用歴	24.4(10/41)	15.2 (5/33)	20.3(15/74)
静脈注射歴	7.3 (3/41)	9.1 (3/33)	8.1 (6/74)
「風俗」経験	9.7 (4/41)	21.2 (7/33)	14.9(11/74)
不特定多数との性交渉	22.0 (9/41)	21.2 (7/33)	21.6(16/74)
同性愛	7.3 (3/41)	0 (0/33)	4.1 (3/74)
HIV 抗体	0 (0/41)	0 (0/33)	0 (0/74)
HCV 抗体	0 (0/41)	0 (0/33)	0 (0/74)
HBs 抗原	7.3 (3/41)	6.1 (2/33)	6.8 (5/74)
HBs 抗体	0 (0/41)	0 (0/33)	0 (0/74)
TPHA	0 (0/41)	3.0 (1/33)	1.4 (1/74)

研究成果の刊行に関する一覧表

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RESEARCH ARTICLE

Open Access

Latin American immigrants have limited access to health insurance in Japan: a cross sectional study

S Pilar Sugimoto^{1*}, Masako Ono-Kihara¹, Mitchell D Feldman² and Masahiro Kihara¹

Abstract

Background: Japan provides universal health insurance to all legal residents. Prior research has suggested that immigrants to Japan disproportionately lack health insurance coverage, but no prior study has used rigorous methodology to examine this issue among Latin American immigrants in Japan. The aim of our study, therefore, was to assess the pattern of health insurance coverage and predictors of uninsurance among documented Latin American immigrants in Japan.

Methods: We used a cross sectional, mixed method approach using a probability proportional to estimated size sampling procedure. Of 1052 eligible Latin American residents mapped through extensive fieldwork in selected clusters, 400 immigrant residents living in Nagahama City, Japan were randomly selected for our study. Data were collected through face-to-face interviews using a structured questionnaire developed from qualitative interviews.

Results: Our response rate was 70.5% (n = 282). Respondents were mainly from Brazil (69.9%), under 40 years of age (64.5%) and had lived in Japan for 9.45 years (SE 0.44; median, 8.00). We found a high prevalence of uninsurance (19.8%) among our sample compared with the estimated national average of 1.3% in the general population. Among the insured full time workers (n = 209), 55.5% were not covered by the Employee's Health Insurance. Many immigrants cited financial trade-offs as the main reasons for uninsurance. Lacking of knowledge that health insurance is mandatory in Japan, not having a chronic disease, and having one or no children were strong predictors of uninsurance.

Conclusions: Lack of health insurance for immigrants in Japan is a serious concern for this population as well as for the Japanese health care system. Appropriate measures should be taken to facilitate access to health insurance for this vulnerable population.

Keywords: Health insurance, Immigrants, Foreign workers, Japan, Latin America

Background

Japan provides universal health insurance and all citizens, including foreigners who stay for a year or more are required to enroll in one of the public health insurance schemes [1,2]. Health insurance coverage remains one of the most important ways to ensure access to health services [3]. With insurance, individuals and families can protect themselves against exceptional health care costs, and access screening services for early detection and treatment of illness [4,5]. Immigrants are a vulnerable population and their access to insurance

and healthcare has been extensively researched in other countries [6-8]. Even in countries with universal health insurance such as Canada or Spain, immigrants face multiple barriers accessing healthcare [9,10], including uninsurance [11].

In Japan, foreigners represent 1.71% of the total population, roughly 2.2 million (as of 2009) [12]. Historically, immigration has played a minor role in Japan's history but the rapid growth of the Japanese economy in the 1980's coupled with a declining birth rate, aging population and younger Japanese labor force favoring higher status jobs, created a strong demand for labor in certain sectors of the economy [13,14]. The revision of the Immigration Law in 1990 led to a large influx of descendants of Japanese emigrants from Brazil and Peru.

* Correspondence: pilarsugimoto@gmail.com

¹Department of Global Health and Socio-epidemiology, Kyoto University School of Public Health, Yoshida-Konoe-cho, Sakyo-ku, Kyoto 606-8501, Japan

Full list of author information is available at the end of the article

Brazilians alone are the third largest minority group (267, 500; 12.23%) after Chinese (680, 500; 31.13%) and Koreans (578, 500; 26.46%), but the occupational structure of Latin Americans differs from these groups. Latin Americans are overwhelmingly manual laborers in the manufacturing industry. In contrast, the occupations of other immigrant groups are more evenly spread between manual production workers, professional and technical, and personal services [15,16]. While in the early years of immigration Latin Americans were mostly temporary guest workers who intended to return home in a few years, more immigrants are settling in with their families [14].

Few prior studies have addressed the problems of healthcare access and uninsurance among foreign immigrants in Japan [17,18]. Findings from these studies are inconclusive because of the non-probabilistic nature of their sampling methods and the low response rates. Some authors speculate that uninsurance may be due in part to a reasoned decision by the immigrants themselves and also to a failure by many companies, especially labor contract companies, to provide insurance [14]. Our study was designed to assess the pattern of health insurance coverage and predictors of uninsurance among documented Latin Americans in Japan in a probability population sample.

Methods

Study setting

The study area, Nagahama City, lies on the eastern shore of Lake Biwa, the largest lake located close to the center of the Japan Peninsula. It extends 164.40 km², divided into 298 townships with nearly 126,000 inhabitants [19]. This city hosts the largest number of Latin American immigrants in the west half of Japan because it is a major industrial center, where a number of automobile related companies employ foreign workers. In Nagahama City, nearly 2% of the population is Latin American [20], while they account for 0.3% of the total population in Japan [12].

Survey instrument

We conducted a preliminary qualitative study in September of 2009. This initial step served several aims. It informed the development of an appropriate instrument for the quantitative survey and provided insight into recruitment issues [21,22]. Twenty Latin American immigrants (not included in the main survey) were recruited purposively in Nagahama and surrounding areas. After explaining the purpose of the study and obtaining individual consent we conducted semi-structured interviews, which lasted between 60 to 90 minutes, and upon completion provided a pre-paid monetary incentive (approximately 25.60 USD). Extensive notes were taken, as recording was not possible. Interviews focused on a range of topics including: current and past health insurance

coverage; barriers for enrollment and payment; health status and access to medical care; work and accidents or problems related to the workplace. We also explored opinions, reasons and circumstances in known cases of uninsurance or personal cases of uninsurance. These findings were used to draft our survey instrument. We developed new questions, modified others found in the literature review [17], and also created response choices for domains related to work, health insurance, and health background and access to healthcare. The instrument was then assessed for its reliability in a test retest design with one week interval in 15 respondents, who were living in Nagahama but were not included in the final survey. All continuous variables showed a high test-retest reproducibility with Pearson correlation coefficient ranging 0.68 - 1.00. In general, categorical variables showed good agreement [23], except for some variables with kappa coefficients less than 0.60 that were excluded from the questionnaire.

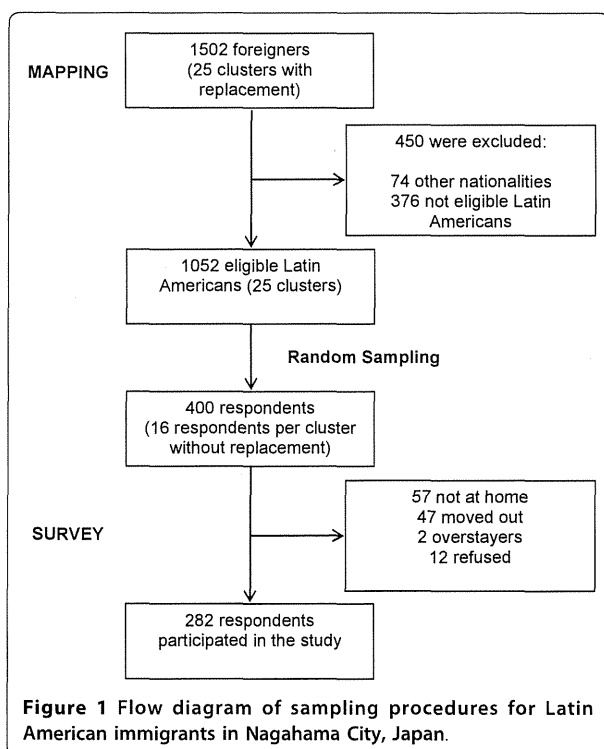
The final survey instrument consisted of five domains: sociodemographic characteristics (12 items), work related (9 items), health insurance (19 items), health background and access to healthcare (14 items), and knowledge and opinion towards HIV/AIDS and HIV testing (14 items). The questions of the last domain were taken from the widely used guidelines for Behavioral Surveillance Surveys (BSS) [24]. Results from this domain, however, were not included in this paper. The instrument was translated into Spanish and Brazilian Portuguese by a bilingual researcher (SPS) and pilot tested for face validity.

Sampling frame and sample selection

The target population was documented residents of Nagahama City from any Spanish or Portuguese speaking country in Latin America, aged 18 or over. Tourists and those who had overstayed their visa were excluded. Since all foreigners legally staying in Japan are registered in the township where they live and these statistics are readily available by township, we decided to use this information to create clusters. First we selected townships with more than 5 registered foreigners as of August 2010 [25] and when necessary we grouped neighboring townships to create 28 clusters having at least 30 immigrants. Then, 400 samples were selected according to a two-stage cluster sampling procedure. In the first stage, 25 clusters were selected with probability proportional to estimated size (PPES) with replacement [26], while in the second stage, 16 participants were randomly selected from each selected cluster without replacement. No information about age or nationality of registered foreigners in each township was available, but we assumed that it highly correlated with that of adult Latin Americans and used it as an estimated cluster size because nearly 80% of the foreign population in Nagahama was either Brazilian or

Peruvian [27]. After mapping, this assumption was proven to be true because the correlation between the number of registered foreigners used as an estimated size of the clusters and the number of eligible Latin Americans identified in our field mapping in each township was very high ($r = 0.98, P < 0.001$).

Since an accurate address was not available for the foreign residents, we had to map the selected clusters to create the sampling frame. To get an idea of their residence distribution, we first collected information through neighborhood associations, private day care centers with foreign children, Japanese language class groups, a Brazilian school, religious associations and several key informants, and then started household visits. During November 2010 through March 2011, we visited initial contacts, labor contract companies' housings, public housings, and interviewed local inhabitants to confirm the presence of Latin American immigrants and collected basic information (gender, nationality, adult/minor and address). When necessary we visited the same dwellings several times, until we reached information saturation. During the mapping we collected information, directly or indirectly, on 1502 foreigners including nationalities other than Latin American such as Chinese, Korean, Philippine, Vietnamese, American, and Australian. Of these, 1052 Latin Americans were identified to be eligible and coded to generate an anonymous list as a frame for random sampling (Figure 1).



Data Collection

The survey was conducted from March through May 2011. Data were collected through face-to-face interviews using a structured questionnaire. The interview was carried out by the lead author (SPS) and the fieldwork team in either Spanish or Brazilian Portuguese and took an average of 15 to 20 minutes to complete. Respondents who were not at home were visited up to 5 times on different hours and days of the week. All interviewers were trained on how to conduct the structured interview, informed of the study purpose, and closely supervised in the field. Interviews were conducted at a place designated by the participants. Before each interview the interviewer explained the purpose of the study, content of the questionnaire, and assured anonymity as well as confidentiality to each participant.

We considered Latin Americans to be those who were born and/or self identified as foreigners coming from Mexico, Central America (except Belize), Cuba, Dominican Republic, and South America (except Suriname, Guyana and French Guiana). Immigration status was addressed by asking the respondents what type of visa they had and if their visa was currently valid. Respondents were classified as uninsured if they reported not having any health insurance at the time of the interview, irrespective if they were the primary holder or dependant. Also, we asked if they knew about the mandatory nature of health insurance in Japan as it may not be the case in their countries of origin

Analysis

Statistical analyses were performed using the Complex Samples module of SPSS version 17.0, a statistical analysis program that accounts for clustering and multiple stages of sampling [28]. All analyses incorporated appropriate standardized sample weights to adjust for nonresponse. Univariate analysis was used to describe the population and bivariate analysis to determine associations between uninsurance and other variables. Finally, factors significantly associated ($p < 0.05$) with being uninsured in the bivariate analyses were compulsorily entered into a multivariate logistic regression model to calculate adjusted odds ratios (AORs) to assess the magnitude of independent association of these predictors with uninsurance.

Ethical issues

The study protocol was reviewed and approved by the Kyoto University Graduate School and Faculty of Medicine Ethics Committee. Verbal informed consent was obtained from all participants.

Results

Of the 400 Latin American immigrants who were selected for the study, 57 (14.3%) were not at home, 47 (11.8%) had moved out, 2 (0.5%) were excluded from our study

because they overstayed their visas and 12 refused to participate. Overall, 282 participants were included in our study (response rate 70.5%). All results that follow reflect weighted data. Table 1 displays the detailed characteristics of respondents. They consisted of slightly more women (51.5%), mostly from Brazil (69.9%), under 40 years of age (64.5%), married (70.4%), with children (75.4%), and reported 11.68 (SE 0.17; median, 12.00) years of formal education. Despite living 9.45 (SE 0.44; median, 8.00) years in Japan and 6.08 (SE 0.47; median, 5.00) years in Nagahama, only 29.2% reported having intentions to stay permanently in Japan (for more information see Additional file 1: Table S1.pdf)

The prevalence of health uninsurance was 19.8%. Those uninsured were more likely to be men ($P = 0.006$), have no children ($P = 0.045$), have less years of formal education ($P = 0.013$), do not know that health insurance was mandatory in Japan ($P < 0.001$), not have visited a doctor in the last 12 months ($P < 0.001$), not have a chronic disease for which they need to visit the doctor's office regularly ($P = 0.016$), have less years employed by the current employer ($P = 0.001$) and ever had a serious accident at work that forced them to see a doctor ($P = 0.020$).

The majority of respondents (73.3%) were employed through a labor contract company, but it was not associated with the insurance status. Those employed full time worked 9.86 (SE 0.18; median, 10.00) hours per day and 5.37 (SE 0.04; median, 5.00) days per week. On average, immigrants had been working for their current employers for much longer periods of time compared to the term of their contracts. Those working full time reported a term contract of 5.97 (SE 0.45; median, 6.00) months, but 3.23 (SE 0.35; median, 2.00) years working for the same employer. Shortest term of contract was 1-2 months and only observed among full time workers (data not shown in the tables). Sources of health insurance coverage were diverse but mostly from the National Health Insurance (NHI), irrespective of whether they were employed or not (Table 2). We also found that 6.0% of the insured had a health insurance provided by their labor contract company.

Most uninsured respondents (68.3%) reported having ever had health insurance at some point in Japan, 64.6% had NHI and 47.4% had Employees' Health Insurance (EHI). However, only 37.1% think they will enroll in a health insurance plan in the next 6 months (data not shown in the tables). The reasons reported as the most important for lacking health insurance coverage are displayed in Table 3. Most respondents cited financial trade-offs as reasons for uninsurance. Many considered the health insurance too expensive (24.0%). In 12.2% of the cases, the respondents stated that the back payments for the time spent without being enrolled is too expensive

and in 10.9% respondents said they would be leaving Japan soon. Employer's refusal of EHI was reported by only 2.0%.

Regarding the correlates of uninsurance (Table 4), multiple logistic regression analysis showed that not having a chronic disease was the strongest predictor of uninsurance (AOR = 12.10). Also, those who do not know that health insurance is mandatory in Japan (AOR = 6.36), have one or no children (AOR = 2.58, 5.23), or have less education (AOR = 3.72) were significantly more likely to be uninsured.

Discussion

To our knowledge, this is the first study using rigorous methodology that demonstrates the pattern of health insurance coverage and the predictors of uninsurance among documented Latin American immigrants in Japan. We found that documented Latin American immigrants in Japan are uninsured at rates that are much higher than has been estimated in the general population (1.3%) [1], we found that almost 20% of the documented Latin American immigrants over 18 years of age lacked health insurance.

Among the immigrants themselves, the most common reason for uninsurance was considering the premiums too expensive. For workers who had not paid into the NHI for many years, back payments of premiums for the time they had lived in Japan without enrolling (up to a maximum of 2 years) to join/rejoin the NHI was also considered to be prohibitively expensive by many of the respondents. Low perceived medical needs and the expectation of a short-term stay in Japan were also among major reasons; these may reflect financial trade-offs. Some of the correlates of uninsurance from multivariate analysis are supportive in this respect since factors related to lower perceived medical needs such as not having or having fewer children, and not having a chronic disease were all strong predictors of uninsurance. Unwillingness of some immigrants to enroll in medical insurance is clearly represented by the fact that only one third of uninsured reported that they will enroll in a health insurance plan in the next 6 months.

In addition, we found that the majority of insured full time employees are covered by the National Health Insurance (NHI) rather than the Employees' Health Insurance (EHI). According to Japan's Health Insurance Act, employers are obligated to enroll their employees and their dependants in the EHI (except those employed 2 months or less, who work less than three quarters of the hours that full time employees work, and those aged 75 years or older) [29]. All those not eligible for EHI such as the self employed, unemployed, and retired younger than 75 years are covered by the NHI; and people aged 75 years and above are covered by the Late Elders' Health Insurance [30,31]. Health insurance coverage patterns

Table 1 Sociodemographic, medical background and work related characteristics of documented Latin American immigrants in Nagahama City, Japan by health insurance status

	Total (n = 282)		Uninsured (n = 56)		Insured (n = 226)		P value
	n	% ^a	n	% ^a	n	% ^a	
Sociodemographic							
Gender							
Men	137	48.5	37	66.1	100	44.1	0.006
Women	145	51.5	19	33.9	126	55.9	
Country of origin							
Brazil	197	69.9	41	73.1	156	69.2	0.073
Peru	46	16.4	4	6.5	43	18.8	
Bolivia	25	8.9	10	18.2	15	6.6	
Others	14	4.8	1	2.2	12	5.4	
Age							
18 - 29	91	32.1	22	39.2	69	30.3	0.102
30 - 39	91	32.4	15	26.2	77	34.0	
40 - 49	55	19.4	16	28.1	39	17.3	
50 or more	45	16.0	4	6.5	42	18.4	
Marriage and live-in partnerships							
Married (living with spouse)	178	63.1	27	49.2	150	66.5	0.132
Married (not living with spouse or other partner)	20	7.3	3	6.0	17	7.6	
Not married (living with partner)	23	8.0	6	10.7	17	7.3	
Not married (not living with partner)	61	21.7	19	34.0	42	18.7	
Number of children							
0	69	24.6	26	45.8	44	19.3	0.045
1	80	28.5	16	28.0	65	28.6	
2	87	30.9	10	17.5	77	34.2	
3 or more	45	16.0	5	8.7	40	17.8	
Years of education							
1 - 8	41	14.5	16	29.1	25	10.9	0.013
9 -12	157	55.6	31	56.2	125	55.4	
13 -16	84	29.9	8	14.7	76	33.7	
Knowledge about mandatory nature of health insurance in Japan							
No	55	19.6	24	43.2	31	13.8	< 0.001
Yes	227	80.4	32	56.8	195	86.2	
Medical background							
Visited a doctor in the last 12 months in Japan ^b							
No/Have never visited a doctor in Japan	86	30.9	34	60.5	53	23.5	< 0.001
Yes	194	69.1	22	39.5	172	76.5	
Chronic disease ^b							
No	238	84.9	54	96.6	184	82.0	0.016
Yes	42	15.1	2	3.4	40	18.0	
Work related							
Working condition							
Full time	209	74.1	43	76.5	166	73.4	0.447
Part time	16	5.7	1	1.8	15	6.7	
Self employed	3	1.1	0	0.0	3	1.4	
Unemployed	53	18.6	12	21.6	40	17.9	
Retired	1	0.5	0	0.0	1	0.6	
Employed through labor contract company ^c							
No	58	25.7	11	24.8	47	27.1	0.852
Yes	167	74.3	33	75.2	134	72.9	

Table 1 Sociodemographic, medical background and work related characteristics of documented Latin American immigrants in Nagahama City, Japan by health insurance status (Continued)

Years employed by the current employer ^c							
0 - 2	131	58.1	34	77.2	97	53.5	0.001
3 or more	94	41.9	10	22.8	84	46.5	
Term of contract with employer (months) ^{b, c}							
1 - 2	25	11.1	8	18.5	17	9.3	0.393
3 - 6	73	32.7	12	28.4	61	33.8	
7 - 24	28	12.3	4	9.5	23	13.0	
Indefinite	44	19.4	6	13.1	38	21.0	
No written contract	55	24.4	13	30.5	41	23.0	
Ever had a serious accident at work that forced you to see a doctor ^b							
No	247	88.2	44	78.7	203	90.6	0.020
Yes	33	11.8	12	21.3	21	9.4	

Note 1: Totals may differ from the sum of categories due to rounding, unless specified

Note 2: Percentages are calculated based on the exact estimated standardized weighted counts

n, rounded estimated standardized weighted count

^a, total percentage may differ from 100% due to rounding

^b, total for the category may be less than the total n due to nonresponse

^c, among the total full time and part time working population (n = 225)

revealed in our participants clearly deviate from the pattern required by the law. This could be discussed from two point of views.

First, immigrants' financial trade-offs may be responsible for the disproportionately low EHI coverage among employed immigrants as workers may select the NHI rather than the EHI; the latter mandatorily includes a pension premium, a preference that has been reported by other authors [14,32,33]. To receive a Japanese pension it is necessary to have paid into the system for 25 years and those who contributed fewer years than the stipulated, receive a maximum refund of only up to 3 years. Considering the fact that the majority of immigrants do not have intentions to stay permanently in Japan (in spite of the fact that most stay for many years), they may not have a strong incentive to enroll in the EHI.

Second, companies may be in part responsible for this inadequate and unusual coverage pattern. While the total

employment period was about 3 years, the average contract period of full time workers was only 6 months. Furthermore, a high percentage of immigrants were working without a written contract. These mechanisms may allow the employer to avoid the obligation of providing EHI, and thus sparing half of the premium for the health insurance and the pension that is coupled with the EHI. Not providing EHI to full time employees who work longer than 2 months is illegal. This situation should be explored in further studies.

The high uninsurance rate among Latin American legal immigrants in Japan is troubling because it could have serious economic and health implications not only for workers themselves but also for their families. Immigrant workers have higher risks of occupational accidents and disability than native workers [34]. In our study uninsured respondents were even more likely to have had a serious accident at work than those insured. Occupational

Table 2 Sources of health insurance by working condition among employed documented Latin American immigrants in Nagahama City, Japan

	National Health Insurance (NHI) (n = 139) %	Employee's Health Insurance (EHI) (n = 70) %	Labor contract company health insurance (n = 14) %	Other public source (n = 3) %	P value
Employed full time	55.5	35.9	8.1	0.5	0.007
Employed part time	72.7	27.3	0.0	0.0	
Unemployed	85.3	11.2	0.0	3.5	
Self employed/ Retired	44.3	33.3	0.0	22.4	
Total	61.7	30.8	6.0	1.4	

n, rounded estimated standardized weighted count

Table 3 Most important reason for lack of health insurance among uninsured documented Latin Americans in Nagahama City, Japan

Reason	% (n = 56)
It's too expensive	24.0
I have too many years without insurance, it's too expensive to enroll now	12.2
I will be leaving Japan soon	10.9
I don't get sick so frequently	9.8
I have to save/send money	8.8
I don't have enough money to pay the health insurance	6.9
I or my spouse lost the job	6.1
Don't understand the Japanese insurance system	6.0
I changed employer	4.6
It's cheaper if I pay the medical expenses	4.0
In transition from another city	2.2
My employer refuses to enroll me in the Employees' Health Insurance (EHI)	2.0
Never thought about health insurance	1.3
If I get seriously sick/injured, I will return to my country	1.2

n, rounded estimated standardized weighted count

Table 4 Correlates of uninsurance by multiple logistic regression analysis among documented Latin American immigrants in Nagahama City, Japan

	%	AOR	95% CI	P value
Sociodemographic				
Gender				
Men	55.6	2.63	(0.68 - 10.12)	0.147
Women	44.4	1.00		
Country of origin				
Bolivia	6.3	2.75	(0.47 - 16.16)	0.214
Others	19.9	0.25	(0.03 - 1.80)	
Brazil	73.8	1.00		
Number of children				
0	26.9	5.23	(2.132 - 12.89)	0.001
1	29.6	2.58	(0.50 - 13.21)	
2 or more	43.5	1.00		
Years of education				
1 - 8	14.1	3.72	(1.14 - 12.15)	0.032
9 or more	85.9	1.00		
Knowledge about mandatory nature of health insurance in Japan				
No	19.8	6.36	(1.34 - 30.25)	0.023
Yes	80.2	1.00		
Medical background				
Visit a doctor in Japan in the last 12 months				
No/Have never visited a doctor in Japan	31.3	2.72	(0.98 - 7.59)	0.055
Yes	68.7	1.00		
Chronic disease				
No	86.0	12.10	(1.56 - 94.09)	0.020
Yes	14.0	1.00		
Work related				
Years employed by current employer				
0 - 2	58.1	1.58	(0.43 - 5.85)	0.464

Table 4 Correlates of uninsurance by multiple logistic regression analysis among documented Latin American immigrants in Nagahama City, Japan (Continued)

3 or more	41.9	1.00		
Ever had a serious accident at work that forced to see a doctor				
Yes	10.7	1.93	(0.68 - 5.47)	0.196
No	89.3	1.00		

AOR, Adjusted odds ratio
 CI, Confidence interval

accidents may have resulted in financial burden which in turn lead to the choice of uninsurance, or employers may have been responsible for both, not providing working safety and health insurance. Whichever the case, outreach programs to persuade the immigrant workers about the importance of health insurance could be promoted through multiple partnerships among peer workers, Japanese care providers, researchers, and community leaders to help them adapt to a new health culture, and increase awareness about health. Such outreach has been used successfully to increase access to healthcare and health information in a culturally sensitive way in other countries [35-37]. Also, audit and legal enforcement on employers should be enhanced so that their employees are adequately insured.

To encourage immigrant employees to enroll in the EHI, policymakers in Japan should consider decoupling the pension premium from the health insurance premium. This would allow them to enroll in health insurance with a lower premium than the NHI. Alternatively, consideration could be given to promote a bilateral social security agreement between Japan and the country of origin of the immigrants to make the pension contributions effective in either country. Brazil is currently the only Latin American country to have recently signed an international social security agreement with Japan, though it is still awaiting implementation [38]. Of course, strict enforcement of the law is necessary to not allow the companies, especially labor contract companies through which the majority of immigrant workers are employed, escape the responsibility to cover their employees by the EHI. Foreign immigrant workers are placed into an unfair situation where the companies that indirectly employ immigrant workers through labor contract companies place responsibility on the labor contract companies, while labor contract companies may try to evade their responsibility to provide health insurance for their employees.

Finally, it should be noted that we found that some labor contract companies provided to their employees private health insurance plans. These programs should be closely monitored as they may allow companies to avoid their share of the premiums for the EHI and pension. Furthermore, health insurance provided by

labor contract companies are not connected to the public health insurance system, thus immigrants may face back payments of premiums when they change employer and wish to join public health insurance programs.

Our findings should be interpreted in the context of their limitations. First, we need to consider the non coverage error [39] that may have arisen from the failure to include some immigrants from the selected clusters into the sampling framework during the mapping stage. Thus, the prevalence of uninsurance we found could in fact underestimate or overestimate the real value. Second, our findings may not be generalizable to other immigrant groups in Japan. However, we believe that our results shed light on the important fact that even in developed countries with universal health coverage, certain minority groups might be left out. Countries trying to achieve universal health coverage need to consider the vulnerability of these populations when planning and implementing reforms. Finally, as with any self reported data, the potential for reporting bias should be considered, as we were unable to verify their health insurance coverage or their legal status through other sources.

Conclusions

We found that among our sample of legal Latin American immigrants in Japan, the proportion of people without health insurance was disproportionately high compared to the estimated national proportion. In addition, the coverage of employees by the EHI was disproportionately low. Appropriate measures should be taken to facilitate access to health insurance for this vulnerable population.

Additional material

Additional file 1: Table S1. Additional information of documented Latin American immigrants in Nagahama City, Japan by health insurance status.

Abbreviations

NHI: National Health Insurance; EHI: Employees' Health Insurance.

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Author details

¹Department of Global Health and Socio-epidemiology, Kyoto University School of Public Health, Yoshida-Konoe-cho, Sakyo-ku, Kyoto 606-8501, Japan. ²Department of Medicine, University of California San Francisco, 1545 Divisadero, Suite 315, San Francisco, CA 94143-0320, USA.

Authors' contributions

All authors conceived and contributed to the study design. SPS conducted the fieldwork and MK supervised the data collection. SPS and MK carried out data analyses. SPS, MDF, and MK interpreted the data. SPS, MDF and MK drafted and revised the manuscript. MOK participated in the revision of the manuscript. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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Research Article

Unintended Pregnancy and Its Correlates among Female Attendees of Sexually Transmitted Disease Clinics in Eastern China

Qiaoqin Ma,¹ Xiaohong Pan,¹ Gaofeng Cai,¹ Jiezhe Yan,¹ Yun Xu,¹
Masako Ono-Kihara,² and Masahiro Kihara²

¹ Department of HIV/STD Control, Zhejiang Provincial Center for Disease Prevention and Control, Hangzhou 310051, China

² Department of Global Health and Socio-Epidemiology, Kyoto University School of Public Health, Kyoto 606-8501, Japan

Correspondence should be addressed to Qiaoqin Ma; qiaoqinma@aliyun.com

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This study is to determine the prevalence of unintended pregnancy and its risk factors among the female attendees of sexually transmitted disease (STD) clinics in Zhejiang Province, China. A self-administered questionnaire survey of a cross-sectional design was administered to attendees at four STD clinics in 2007. Of the 313 female STD clinic attendees, 42.5% reported that they had at least one unintended pregnancy; the induced abortion rate was 39.0%. Over their lifetime, 12.1% responded “use condoms always/often” and 5.4% “always/often used oral contraceptives.” The risk factors for the unintended pregnancy identified by the multivariate analysis were as follows: being married, experience of nonconsensual sex, and a history of STD, having two and over two sexual partners. Unintended pregnancies and induced abortion by female STD clinic attendees have reached an alarming prevalence. Doctors at STD clinics should attach importance not only to the STD problem of the female attendees, but also to the unintended pregnancy and the associated factors. Targeted contraceptive counseling and intervention should be promoted at STD clinics as a strategy to improve the efficiency and effectiveness of the reproductive health services in China.

1. Introduction

Unintended pregnancy is one of the principal reproductive health problems in China; many Chinese females have unintended pregnancies and suffer the consequences. A recent study revealed that 9.1% of the Chinese married females of childbearing age had an unintended pregnancy during the previous year [1]. According to a Health Ministry report, 6–10 million Chinese females underwent induced abortions annually between 2000 and 2009 [2]. In China, reproductive health care is easily accessed through family planning programs that provide contraceptive counseling and education, various contraception services, and induced abortion when necessary. Oral contraceptives (OCs) and condoms are widely available at drug stores and supermarkets. Information on the risk factors for unintended pregnancy is critical for improving the

reproductive health services, to address the gap between the wide availability of contraception and the high prevalence of unintended pregnancy and its consequences. However, little research has examined this in China; the few studies extant focused on university students [3, 4], and females of childbearing age [1] or seeking abortions [5].

The incidences of sexually transmitted diseases (STDs) have increased rapidly in China. The national reported incidence of syphilis increased from 0.09 per 100,000 in 1990 to 23.07 per 100,000 in 2009 [6]. Of the 28 notifiable infectious diseases in China, syphilis ranks the third and gonorrhoea the sixth in terms of both incident cases and incidence rate [2]. With the increase in STD transmission in China, STDs might be more likely to occur in conjunction with unintended pregnancy, as both are due to the consequences of unprotected sex. A high prevalence of STDs has been

identified among pregnant females at antenatal, abortion, and family planning clinics in both China [7–9] and elsewhere [10–12].

Chinese studies have documented that STD clinic attendees rarely protect themselves with condoms during their sexual intercourse, and many are infected with STDs [13, 14]; however, there are no reports of the prevalence of contraception or unintended pregnancy in this population. Therefore, we examined the risks of unintended pregnancy among female attendees at four STD clinics in Zhejiang Province, where the reported incidences of syphilis and gonorrhea are among the highest in China [15].

2. Methods

2.1. Participants and Data Collection. The research method was introduced somewhere else [16]. The participants of this study came from a cross-sectional survey conducted at four STD clinics in Zhejiang Province, Eastern China, from October to December, 2007. In 2007, 12 human immunodeficiency virus (HIV) surveillance sentinels were established at STD clinics in Zhejiang Province, to survey the prevalence of HIV and core information on their behaviors related to HIV transmission in the 3 months from April to June. Of the 12, four STD clinics agreed to conduct this study after reviewing the research protocol. We compared the attendees' gender, age, marital status, and residence between the four participating STD clinics and the remaining eight clinics using the 2007 surveillance data; the demographic characteristics were similar in the two groups. In principle, the study enrolled all sexually active attendees visiting the STD clinics for the diagnosis and treatment of STD, older than 14 years. Those attendees who were not sexually active, unwilling to participate in the study, had a language barrier, or visited the clinics for general skin diseases were excluded.

This paper only includes female STD clinic attendees. In total, 466 females visited the clinics for STD problems during the study period, and 334 females agreed to participate in the study with a response rate of 71.7%. Of the 334 females, 322 gave valid responses. Of these, 6 females only ever had sex with the same sex partner. We omitted these 6 individuals from further analyses because their sexual intercourse evidently could not lead to pregnancy, resulting in a sample size of 316. Those attendees who completed the question on their history of unintended pregnancy over a lifetime were included in the analysis, giving a final sample size of 313 females.

The questionnaire used in this study was developed after a review of the domestic and international literature, and it was modified after repeated discussion among the research team and doctors/nurses at the clinics studied. The final questionnaire had five sections with 7, 10, 21, 8, and 5 questions, respectively. The questionnaires were self-administered and anonymous, and they were collected consecutively by doctors or nurses at the clinics from October to December 2007.

2.2. Ethical Considerations. All attendees of the four clinics who met the recruitment criteria were informed of the study purpose and method and that participant privacy and

confidentiality would be strictly protected. This information was also printed at the beginning of the questionnaire. This research was ratified by the Zhejiang Provincial Health Ministry. Those responsible for institutional review at Zhejiang Province's Center for Disease Control and Prevention and the four STD clinics approved this research and the study protocol.

2.3. Statistical Analysis. The participants were divided into two groups: those who had experienced unintended pregnancy and those who had not.

Participants' experience of unintended pregnancy was used as the dependent variable in the analysis. The independent variables included sociodemographic parameters, variables related to sexual behavior during (i) the first sexual activity, (ii) the participant's lifetime and current time, and (iii) the previous 6 months.

Factors associated with unintended pregnancy were identified using univariate and multivariate logistic regression analyses. Variables significant (P value <0.05) in the univariate analyses, other than those for the previous 6 months, were included in the multivariate models with participant's age, income, education level, marital status, and current employment being fixed in the models. Multivariate analyses were performed using a backward stepwise logistic regression analysis with a P value >0.10 as the removal criterion. A P value <0.05 was regarded as statistically significant. The data were analyzed using SPSS for Windows (ver. 17.0; SPSS, Chicago, IL, USA).

3. Results

Of the 313 female attendees, 133 (42.5%) reported a history of unintended pregnancy and 122 (39.0%) reported a history of induced abortion. The mean \pm standard deviation (SD) number of unintended pregnancies was 1.52 ± 0.86 (range: 1–6); the mean number of induced abortions was 1.49 ± 0.87 (range: 1–6).

Of the participants' variables, age was distributed roughly evenly (Table 1). A percentage of 66.1% of the participants earned less than 2000 renminbi (RMB) per month, 72.8% had not finished high school at most, and 66.5% were married. Regarding the employment status, 29% of the participants were unemployed, 7% were retired, and 8.9% worked in the sector of public service. According to the univariate analysis, participant's age, education level, and marital status were unrelated to unintended pregnancy. Earning a salary \geq 2000 RMB and having worked in the public sector were associated with unintended pregnancy.

Various sexual behaviors at first sex, lifetime, the previous 6 months, and diagnosed STD at lifetime and current time are shown in Table 2. The rate of always/often condom use over the lifetime was 12.1%, while the percentage for OC use was 5.4%. Multiple sexual partners were prevalent, and only 53.4% of participants reported only one partner during their lifetimes.

With respect to risks associated with unintended pregnancy (Table 2), female STD clinic participants who initiated sex at a younger age (versus those who initiated later),

TABLE 1: Demographic characteristics for unintended pregnancy among female STD clinic attendees.

Variable	Total (%) ^a	Pregnancy (%)	Crude OR (95% CI) ^b	P value
Age				
<30	169 (54.0)	70 (41.4)	1	
≥30	144 (46.0)	63 (43.8)	1.10 (0.70–1.72)	0.678
Income per month				
<2000	207 (66.1)	85 (41.1)	1	
≥2000	50 (16.0)	31 (62.0)	2.34 (1.24–4.42)	0.009
Education				
Below high school	228 (72.8)	103 (45.2)	1	
High school and above	84 (26.8)	29 (34.5)	0.64 (0.38–1.08)	0.092
Marriage				
Single	44 (14.1)	15 (34.1)	1	
Cohabitation	55 (17.6)	25 (45.5)	1.61 (0.71–3.65)	0.254
Married	208 (66.5)	90 (43.3)	1.48 (0.75–2.91)	0.264
Employment status				
Unemployed	90 (28.8)	29 (32.2)	1	
Public	28 (8.9)	18 (64.3)	3.79 (1.55–9.23)	0.003
Retired	23 (7.3)	12 (52.2)	2.30 (0.91–5.82)	0.080
Others	169 (54.0)	73 (43.2)	1.60 (0.94–2.74)	0.086

^aPercentages may not add up to 100 due to missing data; ^bOR: odds ratio; CI: confidence interval.

had nonconsensual sex (versus those with no such history), reported having had been diagnosed with an STD (versus those with no such history), having had two or more sexual partners (versus those having only one), rarely/sometimes and always/often used condoms (versus those who never used them), rarely/sometimes used OC (versus those who never used OC), were more likely to report a history of unintended pregnancy during their lifetime. Participants who had more than two sexual partners (versus those having only one), participants who rarely/sometimes and always/often used condoms (versus those who never used them), and participants who rarely/sometimes used OC (versus those who never used them) during the previous 6 months were associated with unintended pregnancy. Condom use and OC use at first sex, current STD diagnosed, and type of sex during lifetime were not associated with unintended pregnancy.

Multivariate logistic regression analysis revealed that being married (odds ratio (OR) 2.99, 95% confidence interval (95% CI) 1.12–7.96), experience of nonconsensual sex (OR 5.83, 95% CI 1.74–19.69), a history of STD (OR 3.31, 95% CI 1.82–6.01), and having two (OR 2.09, 95% CI 1.08–4.05) or more sexual partners (OR 3.02, 95% CI 1.44–6.35) remained risk factors for a history of unintended pregnancy (Table 3). However, the association of age at first sex, condom use, and OC use with unintended pregnancy disappeared in the multivariate analysis.

4. Discussion

This study addressed the gap in knowledge regarding unintended pregnancy and examined the associated factors among women attending four STD clinics. To our knowledge, this is the first quantitative study of its kind conducted in

China. We found that the rate of unintended pregnancy among female STD clinic attendees was 42.5%. The amazingly high rate of unintended pregnancy in this study implies that our participants make poor use of not only barrier methods (such as condoms) but also other effective contraception, putting them at risk of both STDs and unintended pregnancy.

Research has indicated that using condoms correctly and consistently reduces substantially the consequences of unprotected intercourse [17, 18]. We identified a very low rate of condom use; only 12% always or often used condoms during their lifetimes, and around 9% in the previous 6 months. The proportion of our subjects using condom is clearly too small to prevent STDs and pregnancy. Surprisingly, those who always/often or rarely/sometimes used condoms during their lifetimes were more likely to experience unintended pregnancy compared with those who never used condoms in the bivariate analysis; though this correlation did not remain after adjustment for possible confounding, it seems that condom use does not reduce the risk of unintended pregnancy in this study. Those who never used condoms may have adopted other effective contraception, such as an intrauterine device (IUD) or sterilization; consequently, their pregnancy rate was not higher than those who used condoms; furthermore, many international and domestic studies have revealed that condom use was not effective enough in terms of preventing pregnancy, and they, in addition, highlighted the importance of correct condom use every time partners have sexual intercourse [19–21].

The consequences of low condom use are not limited to unintended pregnancy, but they naturally include an increased risk of STDs. A percentage of 39% of the participants was diagnosed with a current STD. The reported history of diagnosed STD reached 28%. We found that those who

TABLE 2: Bivariate correlates of unintended pregnancy with sexual behaviors.

Variable	Total (%) ^a	Pregnancy (%)	Crude OR (95% CI) ^b	P value
Age of first sex				
≥20	190 (60.7)	70 (36.8)	1	
<20	117 (37.4)	61 (52.1)	1.87 (1.17–2.98)	0.009
Condom use for first sex				
Use	28 (8.9)	9 (32.1)	1	
Nonuse/forget	281 (89.8)	122 (43.4)	1.62 (0.71–3.71)	0.253
OC use first sex				
Use	24 (7.7)	11 (45.8)	1	
Nonuse/forget	285 (91.1)	120 (42.1)	0.86 (0.37–1.98)	0.723
Ever nonconsent sex				
No	282 (90.1)	107 (37.9)	1	
Yes	29 (9.3)	24 (82.8)	7.85 (2.91–21.19)	0.000
STD history				
No	218 (69.6)	74 (33.9)	1	
Yes	87 (27.8)	54 (62.1)	3.18 (1.90–5.33)	0.000
Current STD				
No	189 (60.4)	80 (42.3)	1	0.958
Yes	122 (39.0)	52 (42.6)	1.01 (0.64–1.60)	
Partner number over lifetime				
1	166 (53.4)	54 (32.5)	1	
2	67 (21.5)	31 (46.3)	1.79 (1.00–3.19)	0.050
≥3	69 (22.2)	44 (63.8)	3.65 (2.03–6.58)	0.000
Type of sex over lifetime				
Only vaginal	293 (93.6)	122 (41.6)	1	
Ever anal or oral	13 (4.2)	8 (61.5)	2.24 (0.72–7.02)	0.165
Condom use over lifetime				
Never	99 (31.6)	26 (26.3)	1	
Rarely/sometimes	171 (54.6)	86 (50.3)	2.84 (1.66–4.87)	0.000
Always/often	38 (12.1)	20 (52.6)	3.12 (1.43–6.79)	0.004
OC use over lifetime				
Never	144 (46.0)	51 (35.4)	1	
Rarely/sometimes	145 (46.3)	74 (51.0)	1.90 (1.19–3.05)	0.008
Always/often	17 (5.4)	7 (41.2)	1.28 (0.46–3.56)	0.641
Partner number half year ^c				
1	178 (76.1)	74 (41.6)	1	
2	30 (12.8)	11 (36.7)	0.81 (0.37–1.81)	0.613
≥3	18 (7.7)	13 (72.2)	3.65 (1.25–10.69)	0.018
Condom use half year ^c				
Never	101 (43.0)	32 (31.7)	1	
Rarely/sometimes	110 (46.8)	56 (50.9)	2.24 (1.28–3.92)	0.005
Always/often	22 (9.4)	12 (54.5)	2.59 (1.01–6.61)	0.047
OC use half year ^c				
Never	144 (61.3)	54 (37.5)	1	
Rarely/sometimes	74 (31.5)	38 (51.4)	1.76 (1.00–3.10)	0.050
Always/often	11 (4.7)	7 (63.6)	2.92 (0.82–10.43)	0.100

^aPercentages may not add up to 100 due to missing data; ^bOR: odds ratio; CI: confidence interval.

^c235 of females were sexually active in the previous half year.