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Medical Expenditures on and by Immigrant Populations in the United States: A Systematic Review

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Abstract

In health care policy debates, discussion centers around the often-misperceived costs of providing medical care to immigrants. This review seeks to compare health care expenditures of U.S. immigrants to those of U.S.-born individuals and evaluate the role which immigrants play in the rising cost of health care. We systematically examined all post-2000, peer-reviewed studies in PubMed related to health care expenditures by immigrants written in English in the United States. The reviewers extracted data independently using a standardized approach. Immigrants' overall expenditures were one-half to two-thirds those of U.S.-born individuals, across all assessed age groups, regardless of immigration status. Per capita expenditures from private and public insurance sources were lower for immigrants, particularly expenditures for undocumented immigrants. Immigrant individuals made larger out-of-pocket health care payments compared to U.S.-born individuals. Overall, immigrants almost certainly paid more toward medical expenses than they withdrew, providing a low-risk pool that subsidized the

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public and private health insurance markets. We conclude that insurance and medical care should be made more available to immigrants rather than less so.

Keywords
medical expenditures, immigrant expenditures, per capita expenditures, out of pocket expenditures, immigrant health, health care policy

A common misperception among U.S. policymakers and the general public is that immigrants use more health care assets than those born in the United States, thereby draining our country's medical resources[1] Certain advocacy groups have argued that providing health care to immigrants costs state and federal governments billions of dollars annually and that public funding for these expenses is unsustainable.[2] The majority of Americans hold similar opinions: slightly over half of all Americans (52%) currently believe that immigrants burden our country with excessive health care costs.[3] Two-thirds (67%) of the public believe that undocumented immigrants should not be eligible for social services provided by state and local governments.[3]

Federal policies have limited the degree to which immigrants, particularly the undocumented, can access publicly funded medical care and insurance, based on the premise that their tax payments are insufficient to justify access. In 1996, the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) barred legal immigrants from obtaining nonemergency Medicaid.[4] The 2010 Affordable Care Act (ACA) denied legal immigrants access to its health insurance plans until they had completed 5 years of lawful residency and denied undocumented immigrants access to plans, although it otherwise increased health insurance coverage to many low- and moderate-income individuals.[5] These restrictions and denials have produced substantial negative health consequences for immigrant populations in the United States. We consider the development of a comprehensive understanding of what is known about health care spending on and by immigrants to be important.

An increasing number of recent studies have investigated health care spending among immigrants. Yet, no prior studies have comprehensively reviewed this literature to evaluate health care expenditures among immigrant groups and compare health care expenditures between immigrants and nonimmigrants in the United States.

Methods

Our team systematically examined 188 peer-reviewed studies related to health care expenditures on and by immigrants in the United States.

Data Sources and Search Strategy

In 2016 and 2017, we searched PubMed using Medical Subject Headings (MeSH) designed to capture 2 main concepts: immigrants and health care expenditures ("emigration and immigration" [MeSH] OR "emigrants and immigrants" [MeSH] OR "transients and migrants" [MeSH]) AND ("health expenditures" [MeSH] OR "healthcare costs" [MeSH]). We limited our search to articles written in English that were published in the year 2000 or later. This strategy identified 188 articles.

Article Selection

We conducted a 3-stage screening process starting with a title review, followed by an abstract review, and ending with a full-text article review (Figure 1). Articles were included if they provided original data on health care expenditures for and/or by immigrants in the United States. Editorials and opinion pieces were excluded.

In our title review stage, authors independently reviewed the article titles to determine their relevancy. Articles that contained data from the year 2000 or later were included. The title review yielded a total of 40 relevant articles and excluded 148 articles. Through discussion and consensus, we reviewed the abstracts for eligibility and selected 18 papers for a full reading, excluding 22 papers. We ultimately identified 16 articles for inclusion that are summarized in Table 1.

Data Abstraction

The reviewers developed a data abstraction form and independently applied it to 3 articles. After a review of their findings, they finalized the data abstraction tool. Two authors (LZ, LF) abstracted the information from the articles, and 2 other authors (DM, JWB) then reviewed the abstracted information for accuracy and completion. We resolved discrepancies by consensus. Once the data abstraction was completed and reviewed, the authors developed themes and recommendations.

Results

Several articles focused on immigrants with particular legal status (e.g., undocumented immigrants),[7,8] with particular conditions,[9,10] particular ages,[11,13] in particular settings (e.g., emergency departments[14]), or with particular ethnicities (e.g., Latinos[15]), while others focused on immigrant expenditures in general compared to U.S.-born groups.[6,12,16–19] Most articles assessed data from the Medical Expenditure Panel Survey (MEPS).[6,12,16] Two articles focused on the

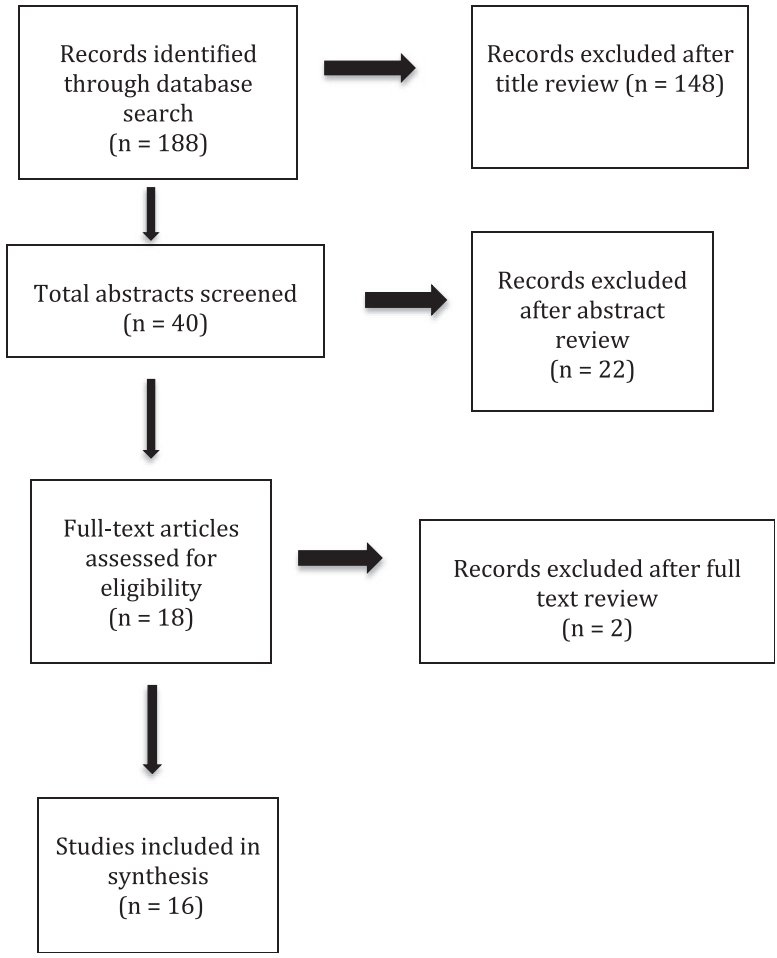

Figure 1. Flow diagram of selection process.

dollar amounts immigrants contributed to Medicare's trust fund versus what they withdrew.[8,18] Table 2 contains a full summary of results.

Expenditures in General

According to 1998 MEPS data, per capita total health care expenditures were lower for immigrants compared to U.S.-born individuals ($1,139 vs $2,546) for all age groups assessed.[12] Overall immigrants' expenditures are one-half to two-thirds of U.S.-born individuals.[12,16] In 2003, recent immigrants (living in the

Table 1. Demographics.

Author	Title	Objective	Number of participants	Population	Setting/resources	Methods	Outcomes	Key findings	Policy recommendations
Vargas Bustamante and Chen[15]	Health expenditure dynamics and years of U.S. residence: analyzing spending disparities among Latinos by citizenship/nativity status	Investigate health expenditure disparities between Latinos and non-Latino whites by years of U.S. residence and citizenship/nativity status	107,535	Latinos and white adults	MEPS and National Health Interview Survey 2000–2007	Two-part multivariate models adjusting for confounding factors; stratified analysis by insurance status checks for the results' robustness	Health expenditure disparities between Latinos and non-Latino whites by years of U.S. residence and citizenship/nativity status	Naturalized and non-citizen Latinos have lower expenditures than U.S.-born whites. Naturalized Latinos have higher expenditures than U.S.-born Latinos. Overall, disparities narrow or disappear for naturalized Latinos the longer they stay in the country.	Health insurance and usual source of care explains inequalities. Future research should analyze whether different eligibility criteria under the Affordable Care Act among documented and undocumented will polarize differences.
Vargas Bustamante and Chen[8,20]	The great recession and health spending among uninsured U.S. immigrants: implications for the Affordable Care Act implementation	Study association between timing of the great recession (GR) and health spending among uninsured adults, distinguishing by citizenship/nativity status and time of U.S. residence	608,867	Uninsured U.S. citizens and immigrants	MEPS (2005–2006, 2008–2009)	Part multivariable logistic regression analysis	Association between the timing of the Great Recession (GR) and health spending among uninsured adults distinguishing by citizenship/nativity status and time of U.S. residence	The probability of reporting any spending diminished for recent immigrants compared to the citizens during GR. For those who did have spending, recent immigrants spent 27% more. Average reductions in total spending were driven by the decline in the share of the population reporting any spending among citizens and noncitizens.	Easing existing health insurance exclusion rules for recent immigrants could address coverage gaps that would persist among U.S. immigrants under the Affordable Care Act implementation.
Castel et al.	Toward estimating the impact of changes in immigrants' insurance eligibility on hospital expenditures for uncompensated care	Assess the effect of Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) on hospital uncompensated care	300	Foreign-born, undocumented population	U.S. Census Current Population Survey and American Hospital Association Annual Survey of Hospitals 1994–1999	Two parts: a series of "data snapshots"	Uncompensated care expenditures in a state level analysis of all states in the U.S.	Controlling for all other variables, a 1% increase in the log of a state's foreign-born population yields a 2.2% increase in uncompensated care, although this result was only significant at the 10 level. A state's decision to implement PRWORA did not independently predict uncompensated care expenditures in our model.	Data limitations limit efforts to obtain monetary estimate of hospitals' financial losses due specifically to PRWORA. Better data sources, particularly at the MSA level, are needed.

(continued)

Table 1. Continued.

Author	Title	Objective	Number of participants	Population	Setting/resources	Methods	Outcomes	Key findings	Policy recommendations
Choi[11]	Out-of-pocket expenditures and financial burden of healthcare among older adults: by nativity and length of residence in the United States	Determining disparities in out-of-pocket (OOP) expenditures for newly arrived older immigrants in U.S. compared to U.S.-born counterparts	24,729	Immigrant and U.S. born	MEPS 2000–2007	Univariate and bivariate statistics used to describe and compare expenditure-related variables and covariates by immigrant status	U.S.-born individuals used as direct comparison with foreign born individuals	Recent immigrants had low overall expenditure for their health status but were more likely to spend a high proportion of income on OOP (33% vs 12.5%), a magnitude greater for low-income recent immigrants compared to low-income U.S. born.	Consider policies that lower financial burden of medical care.
DuBard and Massing[14]	Trends in emergency Medicaid expenditures for recent and undocumented immigrants	Describe emergency Medicaid use by recent and undocumented immigrants in North Carolina	317,090	Recent and undocumented immigrants	Emergency Department 2001–2004	Claims data linked to enrollment files to incorporate sociodemographic characteristics	Patient characteristics, hospitalizations, diagnoses, and Medicaid spending for emergency care	Total spending increased by 28% from 2001 through 2004, with more rapid spending increases among elderly (98%) and disabled (82%) patients. In 2004, childbirth and complications of pregnancy accounted for 82% of spending and 91% of hospitalizations. Injury, renal failure, gastrointestinal disease, and cardiovascular conditions were also prevalent.	Increased access to comprehensive contraceptive and prenatal care, injury prevention initiatives, preventive care, and chronic disease management make better use of public health care dollar by limiting dependence on emergency care.
Goldman et al.[19]	Immigrants and the cost of medical care	Study Los Angeles data to calculate health care costs for immigrants compared to U. S. born.	2,000	Los Angeles immigrants and U.S.-born population	Los Angeles Family and Neighborhood Survey (LAFANS) 1999–2000	Multiplied per capita estimates by the population subgroup based on sex and nativity, using census data	Calculated the use of health care and per capita costs to get population-level estimates of aggregate spending	Spending by foreign-born men was $1,086 less than that of natives, and foreign-born women spent $1,201 less than native-born women, with the bulk of this difference attributable to lower private and public insurance coverage and not out-of-pocket payments. Total medical spending on the undocumented population of Los Angeles County was only	Health care costs are not the major component around which a policy debate about the fiscal benefits or burden of immigrants should focus.

(continued)

Table 1. Continued.

Author	Title	Objective	Number of participants	Population	Setting/resources	Methods	Outcomes	Key findings	Policy recommendations
								6 percent of all medical costs compared with this group's 12 percent population representation.	
Ku[16]	Health insurance coverage and medical expenditures of immigrants and native-born citizens in the United States	Examine insurance coverage and medical expenditures of both immigrant and U.S.-born adults to determine the extent to which immigrants contribute to U.S. medical expenditures	19,073	Immigrant and U.S.-born citizens	MEPS 2003	Two-part multivariate analyses of medical expenditures, controlling for health status, insurance coverage, race/ethnicity, and other sociodemographic factor	Insurance coverage and medical expenditures of both immigrant and U.S.-born adults	Immigrants' per-person unadjusted medical expenditures were approximately one-half to two-thirds as high as expenditures for the U.S. born, even when immigrants were fully insured. Recent immigrants were responsible for only about 1% of public medical expenditures, even though they constituted 5% of the population. After controlling for other factors, immigrants' medical costs averaged about 14% to 20% less than those who were U.S. born.	Public and private insurers could reduce language barriers by paying for interpretation. Insurers – particularly public payers – could increase number of providers, particularly primary care clinicians who practice in areas with higher concentrations of immigrants. Government could improve the equity of access to health insurance by reinstating legal immigrants' eligibility for Medicaid and the Children Health Insurance Program (CHIP), undoing the restrictions imposed under 1996 federal legislation.
Mohanty et al.[12]	Health care expenditures of immigrants in the United States: a nationally representative analysis	Compare overall health care expenditures of immigrants to U.S. born	21,241	Immigrants and U.S. born individuals	1998 MEPS 1996–1997 National Health Interview Survey	Two-part regression model; multivariate adjustment, per capita total health care expenditures of immigrants	Health care expenditures, as well as expenditures for emergency department (ED) visits, office-based visits, hospital-based outpatient visits,	Health care expenditures of immigrants were 55% lower than those of U.S.-born persons ($1,139 vs $2,546). Similarly, expenditures for uninsured and publicly insured immigrants were approximately half those of their	

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Table 1. Continued.

Author	Title	Objective	Number of participants	Population	Setting/resources	Methods	Outcomes	Key findings	Policy recommendations
							inpatient visits, and prescription drugs	U.S.-born counterparts. Immigrant children had 74% lower per capita health care expenditures than U.S.-born children. However, ED expenditures were more than 3 times higher for immigrant children than for U.S.-born children.	
Sheikh-Hamad et al.[10]	Care for immigrants with end-stage renal disease in Houston: a comparison of two practices	Compares utilization, costs of care, and patient satisfaction for undocumented immigrant patients who received emergent dialysis versus scheduled visit dialysis	35	Undocumented immigrants in Texas	Nephrology Department 2002	Fisher exact test, signed exact test, and test	Patient demographics, number of emergency visits, number of hospital admissions and length of stay, and details of dialysis treatments billed for each patient, and the total itemized other costs of care	Costs were 3.7 times higher, utilization was higher, and patient satisfaction was also higher for emergent dialysis as compared to scheduled dialysis patients.	Community-wide policies must be developed to address how to provide care to this population.
Stimpson et al.[17]	Trends in health care spending for immigrants in the U.S.	Examine health care spending during 1999–2006 for adult naturalized citizens and undocumented immigrants	232,389	Immigrants in U.S.	MEPS 1999–2006	Per capita health spending, distribution of age-adjusted public-sector per capita health spending	Total health spending, distribution of age-adjusted public health spending, and trends in uncompensated care as a percentage of people having at least 1 uncompensated health care visit in a year	Average expenditures for naturalized citizens were significantly smaller from 2001 to 2005. Expenditures for noncitizens were about 50 percent smaller, on average, than those for U.S. natives. Public spending for U. S. natives was slightly higher than spending for immigrants in every year of the study period. Although average public expenditures were lower for noncitizens. Uncompensated care declined	Future federal and state health insurance initiatives should consider the evidence presented in this and other recent studies that the cost of providing care to U.S. immigrants is lower than that of covering U.S. natives.

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Table 1. Continued.

Author	Title	Objective	Number of participants	Population	Setting/resources	Methods	Outcomes	Key findings	Policy recommendations
								for all groups after 1999, but the decline was steeper for noncitizens than for other groups studied.	
Stimpson et al.[7]	Unauthorized immigrants spend less than other immigrants and US natives on healthcare	Examine health care expenditures by nativity and legal status, an unauthorized immigrants' expenditures based on demographic information		Undocumented, naturalized, and citizen immigrants and U.S.-born individuals	MEPS 2000 to 2009	Multistep imputation procedure a multivariable regression model to predict medical expenditures for all noncitizen immigrants	Health care expenditures by nativity and legal status	Unauthorized immigrants spent just 1.4 percent of total medical spending in the U.S. Unauthorized immigrants had the lowest expenditures of any group across all health care settings. Only 7.9 percent of unauthorized immigrants had spending for health care from public sources. In contrast, 30.1 percent of U.S. natives had spending from public sources.	Extending coverage to unauthorized immigrants for the prevention and treatment of infectious diseases or granting them access to the Affordable Care Act's insurance marketplaces. Federal immigration reform might also include strategies to expand immigrants' access to health care.
Tarraf et al.[6]	Medical expenditures among immigrant and non-immigrant groups in the U.S.: Findings from the Medical Expenditures Panel Survey (2000–2008)	Examine trends and differences in medical expenditures between noncitizens, foreign-born, and U.S.-born citizens	190,965	Immigrant and U.S. born individuals	MEPS 2000–2008	Regression models, bootstrap prediction techniques, and linear and nonlinear decomposition methods	Evaluate the relationship between immigration status and expenditures, controlling for confounding effects	We found that the average health expenditures between 2000 and 2008 for noncitizens immigrants ($1,836) were substantially lower compared to both foreign-born ($3,737) and U.S.-born citizens ($4,478). Differences were maintained after controlling for confounding effects. Decomposition techniques showed that the main determinants of these differences were the availability of a usual source of health care, insurance, and ethnicity/race.	Lower health care expenditures among immigrants result from disparate access to health care. The dissipation of demographic advantages among immigrants could prospectively produce higher pressures on the U.S. health care system as immigrants age and levels of chronic conditions rise. Barring a shift in policy, the brunt of the effects could be borne by an already overextended public health care system.

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Table 1. Continued.

Author	Title	Objective	Number of participants	Population	Setting/resources	Methods	Outcomes	Key findings	Policy recommendations
Tarraf et al.[13]	Impact of Medicare age eligibility on health spending among U.S. and foreign-born adults	Examine differences in health care expenditures between foreign-born and U.S-born in late mid-life and how these differences change after age 65 with Medicare	46,132	U.S.-born and immigrant adults	MPS data 2000–2010	Propensity score matching, linear modeling to estimate group differences in expenditures, bootstrapping methods to obtain variance estimates for significance testing	Age 55–64, foreign born, and U.S. born spending compared to age 65+ spending	Among adults ages 55–64, the foreign-born spend $3,314 ($p < .001$) less on health care, even when they have equivalent health needs and health care preferences. This difference is due mainly to lower spending through private insurance. After age 65, differences in total spending disappear but not differences in payer-specific spending. The foreign-born continue to spend significantly less through private insurance and begin to spend significantly more through Medicare and Medicaid.	If health insurance were more universal, it would reduce disparities in health care expenditures among immigrants and offset the rise in costs that occurs later in life and reduce the burden on Medicare.
Xiang et al.[9]	Medical expenditures associated with nonfatal occupational injuries among immigrant and U.S.-born workers	Compare rate of nonfatal occupational injuries, medical expenditures per injured worker, and proportion of expenditures paid by workers' compensation for immigrant and U.S.-born workers	36,253	18–64-year-old U.S.-born and immigrant workers	MEPS 2004–2009	Linear regression analysis, adjusting for gender, age, race, marital status, education, poverty level, and insurance	Estimated annual incidence of nonfatal occupational injuries and then used logistic regression models to examine rates of seeking and expenditures by source of payment	Immigrant workers had a statistically significant lower incidence rate of nonfatal occupational injuries than U.S.-born workers. There was no significant difference in seeking medical treatment and in the mean expenditures per injured worker between the 2 groups. The proportion of total expenditures paid by workers' compensation was smaller (marginally significant) for immigrant workers than for U.S.-born workers.	Administrative changes and education programs are needed to help immigrant workers obtain the same benefits from workers' compensation as U.S.-born worker. Government efforts needed to reduce barriers to obtaining workers' compensation benefits for immigrant workers.
Zallman et al.[18]	Immigrants contributed an	Compares Medicare Part	246,135	Immigrant population	MEPS 2002–2009	Chi-square tests for proportions	Medicare expenditures	In 2009 immigrants contributed $13.8 billion more to the	Policies that reduce immigration would almost

(continued)

Table 1. Continued.

Author	Title	Objective	Number of participants	Population	Setting/resources	Methods	Outcomes	Key findings	Policy recommendations
	estimated $115.2 billion more to the Medicare Trust Fund than they took out in 2002–09	A Trust Fund contributions, withdrawals, and net contributions to U.S. born, and compared trends over time				and linear regressions for dollar estimates (including time trends); used sensitivity analyses employing alternative regression modeling strategies		Health Insurance Trust Fund than the trust paid out on their behalf. Most of this surplus came from noncitizens. In each of the years from 2002 to 2009, immigrants contributed a surplus to the Health Insurance Trust Fund, generating a total surplus of $115.2 billion during the period. Their contributions remained largely unchanged over time. During the same period, the net trust fund contributions (contributions minus expenditures) for U.S.-born people declined, generating a deficit of $28.1 billion.	certainly weaken Medicare's financial health, increasing flow of immigrants might bolster its sustainability. Encouraging flow of young immigrants would help offset the aging of the U.S. population and the health care financing challenge that it presents.
Zallman et al.[8]	Unauthorized immigrants prolong the life of Medicare's Trust Fund	Calculate annual and total trust fund contributions and withdrawals by unauthorized immigrants	201,398	Undocumented immigrants	MEPS 2011	Chi-square tests for proportions and linear regressions for dollar estimates	Trust fund contributions and withdrawals	Unauthorized immigrants contributed 2.2 to 3.8 billion more than they withdrew annually (surplus of 35.1 billion).	Policies that limit inflow of unauthorized immigrants may accelerate trust fund depletion; and if there were a pathway to citizenship, they would generate 1 billion more in surplus.

Table 2. Expenditures by Immigrant Groups.

Groups examined	Key findings
Immigrants	Lower medical expenditures by immigrants than U.S.-born citizens,[6,12,16,17,19] even when insured.[16]
	Immigrants with nonfatal occupational injuries have similar medical expenditures to U.S.-born citizens.[9]
	Latino immigrants have lower expenditures than U.S.-born Latinos and U.S.-born white citizens.[15]
Recent arrivals (fewer than 10 years residence)	Recent arrivals have fewer expenditures than more established immigrants and U.S.-born citizens.[15,16]
	During the Great Recession of 2007–2009, undocumented immigrants in the U.S. less than 5 years were less likely to report any health care–related spending and those who did spent more (Vargas Bustamante and Chen, 2014).
Established immigrants (greater than 10 years residence)	Established immigrants have lower expenditures than U.S.-born citizens, particularly if they were undocumented.[15,16]
	Medical expenditures for established immigrants were roughly two-thirds that of U.S.-born citizens.
Undocumented immigrants	Undocumented immigrants had lower expenditures compared to naturalized immigrants and U.S.-born citizens[15,7,12,18,19] and overall contributed a greater amount to Medicare's Trust Fund than they withdrew.[18]
	Undocumented immigrants in the U.S. longer than 5 years had similar health care spending to citizens during the Great Recession 2007–2009 (Vargas Bustamante et al. 2014).
Naturalized immigrants	Lower expenditures for naturalized immigrants compared to U.S.-born citizens.[6,17]
Immigrant children	Lower expenditures among immigrant children, except emergency department expenditures, which are higher among immigrant children compared to nonimmigrants.[12]
Older adult immigrants (greater than age 65)	Lower overall expenditures, but more likely to spend higher proportion of income on OOP expenditures compared to U.S.-born older adults.[11]
	After age 65, differences in spending between foreign-born and native adults disappear due to near universal Medicare coverage.[13]

United States less than 10 years) spent $1,380 annually, whereas U.S.-born individuals spent $3,156 over that same year.[16]

As a group, immigrants consume a disproportionately small percentage of health care costs compared to the U.S.-born population.[12,16,19] Immigrants account for 12% of the population but only account for 8.6% of total U.S. health care expenditures.[7,17] U.S.-born individuals account for 90% of the population but 93% of expenditures.[17] Nationally, from 2000 to 2009, undocumented immigrants accounted for $96.5 billion of health care spending

annually compared with $1 trillion spent by the U.S. born.[7] Undocumented immigrants account for 1.4% of total medical expenditures in the United States, although they make up 5% of the population.[7] After 2003, U.S.- and foreign-born citizens' expenditures were relatively proportional to their population sizes; by comparison, expenditures for undocumented immigrants were 50% to 60% less per capita.[6] In Los Angeles, immigrants are 12% of the population but only account for 6% of expenditures.[19]

Expenditures Over Time

Three studies examined medical expenditures over time.[6,14] Between 2000 and 2008, there was an overall increase in expenditures, but with a steeper increase for U.S.-born individuals.[6] Likewise, between 1999 and 2006, expenditures increased for all groups (undocumented, naturalized, and U.S. born); however spending for the U.S. born increased by twice the amount as spending for the undocumented ($1,000 vs $500).[17] In North Carolina between 2001 and 2004, emergency Medicaid spending on undocumented immigrants increased, primarily on labor and delivery costs as well as treatment for acute medical conditions, because of an increase in the number of undocumented immigrants covered by the program.[14] After age 65, the spending difference between immigrants and U.S.-born individuals decreased as individuals of both groups who paid into Medicare for at least 40 quarters gained access to it.[13] Among Latino immigrants, all subgroups (undocumented, naturalized, and US born) had lower expenditures than non-Latino white U.S. citizens That difference diminished when Latinos had been naturalized citizens for over 10 years.

Medical Expenditures by Citizenship Status

Immigrants, regardless of their legal status, had lower expenditures than their U.S.-born counterparts. Forty-seven percent of immigrants were citizens, and 53% were noncitizens.[17] Undocumented immigrants spent 40%–50% less than U.S.-born individuals.[6,13,17] Based on data from 2000 to 2008, undocumented immigrants spent an average of $1,836 compared with $3,737 spent by foreign-born citizens and $4,478 spent by U.S.-born citizens.[6] Another study found that from 2001 to 2005, spending increased by all groups, but differences in per capita spending increased by over 30% between foreign-born noncitizens and U.S.-born citizens.[17] Spending by noncitizens went up by $500 after 1999, whereas spending by citizens went up by $1,000.[17] From 2000 to 2009, noncitizens spent $500 annually on health care, whereas citizens spent 5 times that amount on health care.[7]

Expenditures by Source of Payment

Latino immigrants were 20% less likely to have health insurance than their non-Latino white U.S.-born counterparts.[15] Even when immigrants were insured,

they had lower health care expenditures. Forty-four percent of immigrants who lived in the United States for less than 10 years and 63% of immigrants who lived in the United States longer than 10 years had health insurance during the 1-year period evaluated (see Table 3).[16] Expenditures of insured immigrants were 52% lower than those of insured U.S.-born individuals. Expenditures for uninsured immigrants were 61% lower compared to uninsured U.S.-born individuals.[12] When noncitizens were fully insured for a year, recent immigrants spent half as much as U.S.-born persons, while established immigrants – those in the United States for longer than 10 years – spent two-thirds that of U.S.-born individuals.[16] Per capita expenditures from private insurers for immigrants were lower than payments for citizens,[7,16,19] although some studies failed to find significant differences[12] or did not comment on the significance.[6,7,19] This indicated that immigrants may constitute a low-risk pool that subsidizes the insurance market for U.S.-born individuals.[16] Immigrants had significantly lower incidence of nonfatal occupational injuries than U.S.-born workers (560 occupational injury events vs 2,176).[9] However, even though immigrants sought medical care to the same degree as U.S. born individuals, workers' compensation expenditures were smaller for immigrant workers compared to U.S.-born

Table 3. Expenditures by Source of Payment.

Source of expenditures	Key findings
Public	Lower public expenditures among immigrants than U.S. born,[12,16,19] particularly among undocumented immigrants.[7] Naturalized immigrants represented a slightly higher share of expenditures funded by public sources compared to U.S. born and undocumented immigrants.[6] Immigrants, including undocumented immigrants, contributed more than they withdrew to Medicare's Trust fund.[8,18] Majority of users of emergency Medicaid are undocumented, although this accounts for less than 1% of total Medicaid budget.[14]
Private insurance	Lower per capita private insurance expenditures among immigrants than nonimmigrants[16,12] or did not comment on the significance.[6,7,19]
Out-of-pocket	Represents larger share of immigrants' health care expenditures among immigrants[11,15,19] and in particular undocumented immigrants than U.S. citizens.[7,19]
Uncompensated care	The few studies that examined uncompensated care visits found a higher proportion of immigrants had uncompensated visits compared to U.S. born.[17]
Workers' compensation	Workers' compensation paid a lower proportion of expenditures for nonfatal occupational injuries for immigrants compared to U. S. born.[9]

workers (workers' compensation paid 57% of medical expenditures for U.S. born workers versus 43% for immigrant workers).[9]

Per capita public expenditures were lower for immigrants overall,[12,19] particularly for the undocumented. One reason may be that it is more difficult for immigrants to get coverage through public health programs than it is for U.S. citizens. During the 6 years studied, undocumented immigrants had median public per capita expenditures of $200 or less, whereas U.S.-born citizens had median expenditures closer to $1,100 annually.[17] From 2000 to 2009, 8% of undocumented immigrants received public sector coverage, whereas 30% of U. S.-born individuals received public sector coverage.[7] The 8% of undocumented immigrants with public sector coverage recieved an average of $140 per person per year compared to $1,385 per person annually for U.S.-born citizens. For undocumented immigrants, public expenditures represented one-eighth of total expenditures as compared to one-third for U.S. citizens.[7] In Los Angeles county, even though immigrants had disproportionately lower incomes than U.S. citizens, only 16% of medical costs for immigrants were paid through public sources compared to 21% for U.S. citizens.[19] Of note, Tarraf (2012) found that, from 2000 to 2008, foreign-born citizens had the highest use of public sources compared to both undocumented immigrants and U.S.-born citizens, with an especially sharp increase in 2007.[6]

Undocumented immigrants, particularly those both elderly and recently arrived, paid a large share of the out-of-pocket (OOP) expenditures made by all immigrants.[6,11,15] This is due partly to lower use of public funds and lower rates of private insurance. In Los Angeles County, 27% of medical expenditures for immigrants were OOP expenses, compared to 20% for U.S. born.[19] From 2000 to 2008, the proportion of OOP expenditures was similar for foreign-born and U.S.-born citizens but higher for noncitizens.[6] From 2000 to 2007, Latino individuals consistently had OOP expenditures that were approximately 6% higher than their non-Latino white counterparts.[15] OOP expenditures were even higher for naturalized Latinos (42%), and undocumented immigrants (51%) than for non-Latino whites.[15] Choi studied financial burden, measured as the percentage of personal income spent on OOP medical payments. Recent immigrants over the age of 65 spent less OOP than their U.S. counterparts ($808 vs $1,571), although the financial burden was greater for recent immigrants (33% vs 12% of their income).[11] Low-income recent immigrants were 4 times more likely to spend 50% of their income on OOP payments than other groups.[11]

Some studies examined use of uncompensated care by immigrants compared to other groups.[7,17] Approximately 13% of undocumented immigrants had at least 1 uncompensated visit in a year, versus 11% of U.S.-born citizens; foreign-born citizens and U.S.-born citizens had similar rates of uncompensated care use.[17] Another study found that undocumented immigrants were twice as likely as U.S.-born citizens to use uncompensated care.[7] One study aimed to estimate

the impact of the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) on hospital expenditures for uncompensated care, as PRWORA gave states the option to withdraw Medicaid coverage for nonemergency care from most legal immigrants. Curtis and colleagues (2003) found a 1% increase in the log of state's immigrant population led to a 2.2% increase in uncompensated care that was nonsignificant. Apparently the decision to implement PRWORA and the number of immigrants in that state had no significant impact on the hospital expenditures for uncompensated care.

Two studies demonstrated that immigrants made high health care contributions in relation to expenses.[8,18] Although this is not surprising, given that many undocumented immigrants contribute to the Medicare Health Insurance Trust Fund but do not receive benefits, it goes against the common misconception that immigrants are responsible for the high cost of health care in this country. From 2002 to 2009, immigrants paid more to the trust fund than they withdrew, generating a yearly surplus of $11–$17 billion.[18] From 2000 to 2011, undocumented immigrants contributed $2–$3 billion more to the trust fund than they withdrew, thereby extending the life of the fund.[8] The data suggests that immigrants' payments similarly subsidize private insurance companies.[16]

Expenditures by Age Group

The expenditures of immigrants compared to U.S.-born individuals varied according to age groups. Total health expenditures were lower for immigrants of all age groups compared to U.S. born, though there was not a statistically significant difference between the immigrants and U.S. born over age 65.[12] Immigrant children (below age 12) had medical expenditures that were 49% lower than U.S. children, and immigrant adolescents (ages 12–17) had expenditures 76% lower than U.S.-born adolescents. Immigrants between ages 55 and 64 spent $3,314 less on health care than U.S.-born counterparts, but after age 65 the differences in total spending disappeared, in part because after age 65, substantial numbers of immigrants qualify for Medicare.[13]

Discussion

Many Americans, including some in the health care sector, mistakenly believe that immigrants are a financial drain on the U.S. health care system, costing society disproportionately more than the U.S.-born population, i.e., themselves. Our review of the literature overwhelmingly showed that immigrants spend less on health care, including publicly funded health care, compared to their U.S.-born counterparts.[6,7,12,13,15–17,19] Moreover, immigrants contributed more towards Medicare than they withdrew; they are net contributors to Medicare's trust fund.[8,18]

Our research categorized immigrants into different groups, but in all categories, these studies found that immigrants accrued fewer health care expenditures

than U.S.-born individuals. Among the different payment sources – public, private, or out-of-pocket – public and private expenditures were lower for immigrants,[7,12,16,19] with immigrants spending more out-of-pocket.[11,19] Differences decreased the longer immigrants resided in the United States.[13,15]

While annual U.S. medical spending in 2016 was a staggering $3.3 trillion,[20] immigrants accounted for less than 10% of the overall spending – and recent immigrants were responsible for only 1% of total spending.[19] Given these figures, it is unlikely that restrictions on immigration into the United States would result in a meaningful decrease in health care spending. To the contrary, restricting immigration would financially destabilize some parts of the health care economy, as suggested by Zallman and colleagues, who found that immigrants contributed $14 billion more to the Medicare trust fund than they withdrew.[18]

Apart from various barriers to access, part of the disparity in health care spending may be due to a "healthy immigrant effect," meaning that recent immigrants tend to be young and robust when they arrive.[15,21] On average, immigrants are younger and healthier than nonimmigrants and need less medical care. Still, the lack of insurance coverage and restricted access to care must be considered in a full accounting for the low amounts of spending on immigrants compared to nonimmigrants. Ku[16] found that less than half of recent immigrants are insured, partly because even documented immigrants are banned from getting government-sponsored health insurance for the first 5 years after entering the country. The disparity in health care spending tended to decrease as people aged, and when immigrants reached the age of 65, differences in total spending disappeared between U.S.- and foreign-born people. The nearly universal access to Medicare is partly responsible; however, the immigrant spending increase may also exist because they were unable to access preventive care earlier in their lives.[13] Additionally, when immigrants first arrive in the United States, they are less familiar with the system and less likely to sign up for care. Thus, it is not surprising that the existing differences between foreign- and U.S.-born people tends to decrease the longer immigrants live in the United States, particularly as many are eventually granted citizenship.[15]

Even though recent immigrants could be vigorous, young financial assets for the health care system, they are systematically excluded from it. In addition to the 5-year ban on participation in public insurance programs as noted above, immigrants often rely on safety-net options that are limited and overburdened.[22] Those who do not are often obliged to rely on emergency care or pay OOP for services. When they succeed in receiving care, the quality of the care can be limited by various forms of discrimination, language barriers, and fears of deportation. Researchers have raised the concern that when immigrants are spending approximately one-third of their total income on OOP medical payments, they cannot build a middle-class life.[11]

Risk of discovery and deportation have become even larger obstacles to immigrants obtaining health care. Families who do not know what will

happen if their children are deported or if one or both parents are forced to leave the country may be particularly fearful.[23] The children of immigrants are disproportionately underserved by the health care system because of barriers their parents face.[12] When immigrants are under emotional stress because of fear of deportation and financial stress because they do not receive benefits available to low-income Americans, immigrants have less chance to enter the middle class. If immigrants had additional support to enter the middle class, they would be able to buy homes, purchase cars, buy goods, and further drive the growth of the U.S. economy.

The 8 papers of our review, which found immigrants had far lower expenditures than U.S. citizens, made similar policy recommendations. Nonfinancial barriers to health care must be decreased so that healthy immigrants can stay healthy. Providing bilingual primary care, high-quality interpreter services,[16] and access to preventive services, such as treatment of infectious disease,[7] would reduce barriers. Mohanty[12] suggested ending the option for states to restrict health care coverage for immigrant children because they grow up to be a major part of the American workforce; Tarraf suggested that emergency Medicaid be expanded to cover preventive care and screening services.[6]

Fiscal responsibility is an important reason for the United States to provide insurance for newly arrived immigrants, as they could continue to enlarge the low-risk pool of healthy individuals that helps offset the cost of insuring high-risk individuals. Currently, under the ACA, undocumented immigrants cannot enroll in the state health care exchanges. If we are seeking to minimize costs, which would seem a major factor in the reasoning of policymakers who would deny immigrants care, then it makes financial sense to enroll individuals who will (on average) contribute more to the health care system than they withdraw. Healthy, young immigrants are precisely whom we should target for Medicaid enrollment, state exchanges, or private health insurance.

Among the limitations of this study was the inability to accurately assess how much uncompensated care is being delivered to immigrants. We have limited data on expenditures for undocumented immigrants as well as insufficient estimates of possible monetary losses to hospitals and other institutions. Additionally, we have insufficient information about expenditures on immigrant children. We did not include studies on expenditures outside the United States nor capture the extent to which immigrants may travel outside of the United States to receive care.

Further research is indicated, including examining how closely health care expenditures are related to the ability to access care as well as possible impacts of the ACA on immigrants' ability to access health insurance. As the ACA's mandates are eroded by the current administration, assessing the changing effects on immigrants will also be necessary.

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