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Inequities in Access to Medical Care Among Adults Diagnosed with Diabetes: Comparisons Between the US Population and a Sample of US-Residing Marshallese Islanders

Samuel D. Towne[1,2,3,4,5], **Karen H. Kim Yeary**[6], **Marie-Rachelle Narcisse**[7], **Chris Long**[7], **Zoran Bursac**[8], **Rachel Totaram**[1], **Elisa M. Rodriguez**[6], **Pearl McElfish**[7]

[1]Department of Health Management and Informatics, University of Central Florida, Orlando, FL 32816, USA

[2]Disability, Aging, and Technology Cluster, University of Central Florida, Orlando, FL 32816, USA

[3]Department of Environmental and Occupational Health, School of Public Health, Texas A&M University, College Station, TX 77843, USA

[4]Southwest Rural Health Research Center, Texas A&M University, College Station, TX 77843, USA

[5]Center for Population Health and Aging, Texas A&M University, College Station, TX 77843, USA

[6]Department of Cancer Prevention and Control, Roswell Park Comprehensive Cancer Center, Elm and Carlton Streets, Buffalo, NY 14263, USA

[7]College of Medicine, University of Arkansas for Medical Sciences Northwest, 1125 N College Ave, Fayetteville, AR 72703, USA

[8]Department of Biostatistics, Robert Stempel College of Public Health, Florida International University, 11200 SW 8th Street AHC5, Miami, FL, USA

Abstract

Objective—We examined barriers to accessing medical care for migrant US-residing Marshallese Islanders.

Methods—Cross-sectional analyses were conducted to identify potential inequities. Surveys from largely migrant diabetic Marshallese Islanders ($n = 255$) were compared with nationally representative data. Two major outcomes were assessed including 1—whether or not one reported having forgone medical care in the past year because of cost—and 2—whether or not one reported not having a usual source of care.

Results—Overall, 74% and 77% of Marshallese Islanders reported forgone care and no usual source of care, respectively, versus 15% and 7% of the US diabetic population. In multivariable analyses, being younger; uninsured; unemployed; male; of lower education; Native American or

✉Samuel D. Towne, samuel.towne@ucf.edu.

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Hispanic (versus White); and residing in the South were associated with *forgone* care nationwide, whereas only lacking insurance was associated with *forgone* care among Marshallese Islanders. Nationwide being younger; uninsured; unmarried; female; of lower education; Native American or Hispanic (versus White); and residing in the South were associated with *not* having a usual source of care, whereas only being younger and uninsured were associated with *not* having a usual source of care among Marshallese Islanders.

Conclusion—The largest group of diabetic Marshallese Islanders in the continental US faces severe healthcare access inequities necessitating policies that increase access to health insurance options and associated resources.

Keywords

Health disparities; Social determinants of health; Health inequities; Immigrant health

Introduction

Barriers to accessing necessary health care can be burden-some, especially for individuals trying to manage complex chronic diseases, such as diabetes. The World Health Organization (WHO) estimated that 422 million adults had type-2 diabetes (T2D) worldwide as of 2014, a nearly fourfold increase over the estimated 108 million in 1980 [1], making this both a critical and rapidly intensifying issue in need of amelioration. The burden associated with diabetes is also severe. Diabetes is linked to mortality (1.5 million deaths in 2012) [1] and causes serious complications that can lead to premature death [1]. Health care access is a critical component for persons with diabetes to prevent complications and optimize health [2]. Factors that serve as barriers to accessing health care are particularly important to identify among at-risk populations with diabetes. Past evidence has reinforced this, where among those with diabetes, being uninsured and lacking a usual source of care have been shown to be linked to both a greater likelihood of delays in seeking urgent care and having unmet medical needs [3]. Identifying high-risk populations that can be targeted by tailored policy and community-based interventions complements the many critical components necessary to lower diabetes-related complications and diabetes mortality rates. High-risk groups can be classified in many ways including, but not limited to, education, race and ethnicity, and income [4]. The current study largely focusses on identifying potential barriers in accessing medical care with major comparisons across race and ethnicity highlighting a particularly high-risk and relatively understudied population. Marshallese Pacific Islanders with diabetes residing in the continental US have some of the highest rates of diabetes worldwide; however, there are gaps in what is known regarding access to care for this population.

The Republic of the Marshall Islands (RMI), a cluster of Pacific islands and atolls [5, 6], is located between Hawaii and Australia. Our focus on the largest population of mostly migrant Marshallese Islanders residing in the continental US is driven by their unique standing on the global stage in terms of T2D. Using data from the World Bank's online data tool (population aged 20–79 years), we find that the rate of diabetes in the Marshall Islands, at 30.5%, was more than 3 times the worldwide rate (8.5%) [7], making it the highest of any nation highlighted in the data. Therefore, migrants from the Marshal Islands to the USA may

be a particularly at-risk population. It is also relevant to note that the rates of diabetes in the USA, while lower than that of the Marshall Islands, were also higher than the worldwide rate reaching 10.8% as of 2017 [7]. Among Organisation for Economic Co-operation and Development (OECD) nations, the USA has among the highest rates of diabetes [8], thereby making study of diabetes among individuals of these two nations of particular interest. In addition, the USA and the Marshall Islands have a history that links these nations with a recent migration of Marshallese Islanders leaving the Marshall Islands to live and work in the USA [9].

In the 1940s and 1950s, the US Nuclear Testing Program tested a huge payload (many times that dropped in Hiroshima) in the RMI [10–15]. Inhabitants of the bombed islands and atolls were relocated; however, residents of nearby atolls were not, thereby experiencing nuclear fallout [16–25]. Natural food supplies on these atolls became and remain contaminated. Subsequently, the Marshallese diet shifted from one rich in native foods that facilitated healthy dietary choices to foods common in western cultures, those heavily processed and high in sugar and fat [13, 14]. Further, past studies have also reported low levels of physical activity among Marshallese Islanders, with 11.5% and 22.5% of respondents reporting engaging in moderate-intensity and high-intensity physical activity, respectively [26]. In addition, previous qualitative research, while limited by a small sample size and restricted to those already living in the USA, has demonstrated that some US-residing Marshallese individuals reported feeling that diabetes is inevitable, while also not aware of potential positive benefits of diabetes self-management if diagnosed [27]. This has led to an increase in diabetes rates and preventable conditions [28].

After World War II, the Marshall Islands was a Trust Territory of the USA, and in the 1980s, became a sovereign nation through a Compact of Free Association (COFA) with the USA. The COFA allows Marshallese to move to the USA (e.g., live, work, study) without requiring a visa or permanent resident card; [29] as a result, Marshallese Islanders are free to seek employment in the USA, which they have been doing at increasing rates since the late 1980s due to a lack of employment opportunity in the RMI [29]. According to data from the 2010 US Census measuring the total number of Native Hawaiian and Other Pacific Islander (NHPI), approximately 22,434 individuals reporting “detailed NHPI group alone or in any combination” reported Marshallese [30]. Over the course of the next few decades, it is expected that more Marshallese will live in the USA than in the Marshall Islands [31]. Many Marshallese have migrated to the northwest part of Arkansas. Arkansas now has the largest Marshallese population within the continental US with ~ 10,000–12,000 Marshallese [32].

Although COFA migrants have increased exponentially in the USA, COFA migrants are not eligible for Medicaid [9]; it is unknown the extent to which this considerable health care access barrier affects the health of COFA migrants, as many receive private insurance through employment. Within the USA, Marshallese Islanders are disproportionately affected by T2D which accounted for one third of Marshallese deaths from 1996 to 2000 [6]. While research is limited, pilot studies ($N = 401$) report that 38.4% of Arkansas-residing Marshallese have diabetes and 32.6% have prediabetes [33]. Ensuring adequate and equitable access to health care among this vulnerable population is critical for health equity, particularly given the unique health care access barriers Marshallese US migrants face.

However, to the authors' knowledge, healthcare access has not been thoroughly examined among US-residing Marshallese Islanders with T2D.

Objectives

Diabetes is clearly a critical issue facing both the Marshall Islands and the USA, and the recent migration of Marshallese Islanders to the USA provides a unique opportunity to assess factors associated with barriers to accessing medical care among this particularly vulnerable population. Therefore, we aimed to examine barriers to accessing medical care across two items: (1) forgone medical care due to cost and (2) not having a usual source of care. We present analyses from a sample of Marshallese Islanders with diabetes in Arkansas and the US population with diabetes.

Methods

Data

Two datasets were used in analyses for comparison between Marshallese Islanders with T2D in the USA and the general US population with diabetes, of which approximately 90–95% have T2D [34].

National Estimates—The Behavioral Risk Factor Surveillance System (BRFSS) database (2016) was used to serve as a comparison to data collected (using the same survey items as the BRFSS) among a sample of Marshallese Islanders residing in the continental US collected during a similar timeframe. As a nationally representative database of non-institutionalized adults, the BRFSS provides a national snapshot (cross-sectional design) of health and related outcomes. The unweighted sample size for the 2016 sample included 486,303 respondents. Only those diagnosed with diabetes (n = 66,053) were included in analyses.

Marshallese Islander Estimates—Data from Marshallese Islanders were collected in 2015–2017 from participants recruited through a community-based diabetes education program. Those with a diagnosis of T2D were included (n = 255). Based on comparisons with our sample and published data by the US Department of the Interior (e.g., indicating somewhat similar rates of educational attainment [35]), data published in reports based on the American Community Survey (e.g., somewhat similar rates for marital status such as the percent married [36]), and the experience of several members of the research team, who have been conducting research within this population for several years, it was estimated that this sample was likely representative of the larger population of Marshallese Islanders residing in Arkansas—which represents the largest population of Marshallese Islanders within the continental US [37].

Outcomes of Interest

Forgone Medical Care due to Cost in the Past 12 Months—The BRFSS survey item in both the general survey and the Marshallese survey included the following: *Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?* [38], coded as yes or no.

Usual Source of Care—The BRFSS survey item in both the general survey and the Marshallese survey included the following: *Do you have one person you think of as your personal doctor or health care provider?* [38], coded as yes or no.

Variables of Interest—Age, a categorical variable in the BRFSS, was coded as 18–44 years, 45–54 years, 55–64 years, and 65 years and older. Insurance status was coded as insured or not insured. Marital status was coded as married or not married. Employment (employed for wages versus not employed) and education (less than high school graduate or equivalent versus higher) were included as a proxy for socioeconomic status. We also included race (non-Hispanic American Indian or Alaska Native, non-Hispanic Asian, non-Hispanic Black or African American, non-Hispanic White, other non-Hispanic), and ethnicity (Hispanic) in the national comparison. Additionally, given the regional location of the Marshallese Islanders sample, we included region in the national comparison.

Statistical Analyses—SAS 9.4 (Cary, NC) was used for analyses of the national BRFSS data, while Stata SE 15 was used to analyze the Marshallese Islander sample. SAS survey procedures were used to account for the complex sampling frame of the BRFSS. Given the dependent variables were binary, logistic regression was used to assess the likelihood of our outcomes with odds ratios and corresponding 95% confidence intervals (alpha = 0.05).

Results

Descriptive Statistics

Diabetes—Overall, the rate of T2D in the BRFSS sample at approximately 10.8% was roughly a third the rate at 30.5% [7] reported among Marshallese Island residents (national estimates from the Republic of the Marshall Islands) and 38.4% reported in Arkansas in previous research [33]. In terms of age, a similar proportion, roughly 1-in-4 were aged 55–64; however, whereas the largest segment of the US population with diabetes were aged 65 and older, among the sample of Marshallese Islanders residing in the USA with diabetes, the largest segments were those aged 18–44 years followed closely by those aged 45–54 years (see Table 1).

Forgone Medical Care due to costs—Nationwide, approximately 15% of those with diabetes reported forgone medical care due to cost (see Table 1). In contrast, approximately 74% of sampled Marshallese Islanders with diabetes residing in the USA reported forgone medical care due to costs.

Lacking a Usual Source of Care—Nationwide, approximately 7% of those with diabetes reported they did not have a usual source of care. In contrast, approximately 77% of sampled Marshallese Islanders with diabetes residing in the USA reported they did not have a usual source of care.

Unadjusted Analyses

Forgone Medical Care due to Costs—Nationwide, age, insurance status, marital status, employment, sex, education, race and ethnicity, and region were all significantly

associated with forgone medical care due to costs (see Table 2). In particular, being in younger ages including ages 18–44 (versus older ages); not being insured (versus insured); not being married (versus being married); being employed (versus unemployed including retired); being female (versus male); having less than a high school education (versus high school or equivalent or higher); being American Indian or Alaska Native, Hispanic, Black or African American, or Other (versus being Non-Hispanic White); and residing in the South (versus all other regions) were associated with a higher likelihood of reporting forgone medical care due to cost among those with diabetes.

Among US-residing Marshallese Islanders with diabetes, insurance status, employment, and sex were all associated with forgone medical care due to costs. In particular, not being insured (versus insured), not being employed (versus employed), and being female (versus male) were associated with a higher likelihood of reporting forgone medical care due to cost.

Lacking a Usual Source of Care—Nationwide, age, insurance status, marital status, employment, sex, education, race and ethnicity, and region were all significantly associated with reporting not having a usual source of care. In particular, being age 18–44 (versus older ages); not being insured (versus insured); not being married (versus being married); being employed (versus unemployed including retired); being male (versus female); having less than a high school education (versus high school or equivalent or higher); being American Indian or Alaska Native, Hispanic, Black or African American, or Other (versus being Non-Hispanic White); and residing in the South (versus the North and Midwest regions) were associated with a higher likelihood of reporting not having a usual source of care among those with diabetes.

Among US-residing Marshallese Islanders with diabetes, age and insurance status were associated with reporting not having a usual source of care. In particular, being age 18–44 (versus age 55–64 and 65 and older) and not being insured (versus insured) were associated with a higher likelihood of reporting not having a usual source of care.

Multivariable Analyses

Forgone Medical Care due to Costs—Nationwide, age, insurance status, employment, sex, education, race and ethnicity, and region were all significantly associated with forgone medical care due to costs among those with diabetes (see Table 3). In particular, being age 18–44 (versus those age 55–64 and 65 and older), not being insured (versus insured), not being employed (versus employed), being female (versus male), having less than a high school education (versus high school or equivalent or higher), being American Indian or Alaska Native or Hispanic (versus being Non-Hispanic White), and residing in the South (versus all other regions) were associated with a higher likelihood of reporting forgone medical care due to cost.

Among US-residing Marshallese Islanders with diabetes, only insurance status was associated with forgone medical care due to costs. In particular, not being insured (versus insured) was associated with a statistically significant higher likelihood (OR = 5.00, 95% CI 2.60–9.64 for those not insured as compared with those who were insured) of reporting forgone medical care due to cost.

Lacking a Usual Source of Care—Nationwide, age, insurance status, marital status, sex, education, race and ethnicity, and region were all significantly associated with reporting not having a usual source of care among those with diabetes. In particular, being age 18–44 (versus older ages); not being insured (versus insured); not being married (versus being married); being male (versus female); having less than a high school education (versus high school/equivalent or higher); being American Indian or Alaska Native, Hispanic, or other (versus being Non-Hispanic White); and residing in the South (versus the North and Midwest regions) were associated with a higher likelihood of reporting not having a usual source of care.

Among US-residing Marshallese Islanders with diabetes, age and insurance status were associated with reporting not having a usual source of care. In particular, being age 18–44 (versus age 55–64 and 65 and older) was associated with a statistically significant higher likelihood (OR = 0.20, 95% CI 0.07–0.58 for those *aged 55–64* as compared with those *aged 18–44 years*, and OR = 0.18, 95% CI 0.05–0.63 for those *aged 65 and older* as compared with those *aged 18–44 years*) of reporting not having a usual source of care. In addition, not being insured (versus insured) was associated with a statistically significant higher likelihood (OR = 6.05, 95% CI 2.97–12.31 for those not insured as compared with those who were insured) of reporting not having a usual source of care.

Discussion

We identified significant inequities facing migrants with T2D from the Marshall Islands residing in the continental US. Past studies using data from 2002 to 2005 have explored having a usual source of care among those with diabetes nationwide, concluding that lacking a usual source of care and being un-insured were associated with a lower odds of receiving health-related examinations (e.g., hemoglobin A1C tests, blood pressure [3]). Thus, the current study builds upon the strong connection between barriers in access to care and the likelihood of receiving potentially critical medical examinations that may lower the likelihood of diabetes-related complications.

Our findings indicated that approximately three-in-four Marshallese Islanders with diabetes reported forgone medical care. This is in stark contrast to the estimated 15% reported nationwide. Similarly, approximately three-in-four Marshallese Islanders with diabetes reported not having a usual source of care. Again, this is a major difference from that reported nationwide, where just 7% reported not having a usual source of care among those with diabetes as defined in the current analyses. Thus, Marshallese Islanders in the study show extreme health disparities that provide critical and timely information to key stakeholders. Therefore, identifying factors associated with both forgone medical care and not having a usual source of care can serve as targets for interventions (e.g., policy interventions, educational awareness). For example, the existing literature highlights diets characterized as heavily processed and high in sugar and fat [13, 14] in addition to low levels of physical activity [26] among Marshallese Islanders. Interventions targeting healthful diets and adequate physical activity can serve as both preventative measures (e.g., preventing those with pre-diabetes from developing diabetes) and tertiary measures (e.g., chronic disease self-management among those already diagnosed with diabetes). In addition,

previous work highlighting limited awareness of potential positive benefits of diabetes self-management if diagnosed [27] is a potential target for clinical interventions including physician referral to community- and evidence-based programs focused on diabetes [39] or chronic disease self-management in general [40]. These behavioral interventions may hold promise for ameliorating the burden of diabetes among at-risk groups, such as Marshallese Islanders.

Among the factors associated with forgone medical care due to cost, lacking health insurance, not being employed, and being female all served as risk factors among Marshallese Islanders. When considering several factors simultaneously, only insurance status (lacking insurance) remained a significant factor associated with forgone medical care due to cost. This highlights the critical need for relevant public policies that are aimed at bridging significant gaps in access to health insurance, especially for those in occupations not provided health insurance through their employer. For example, while Marshallese Islanders are afforded the right to be in the USA, there appears to be a lack of targeted policies and information on how to access health insurance, potentially serving as barriers in accessing affordable health care. Policies limiting COFA migrants from being eligible for some federal benefits [41] namely Marshallese Islanders eligibility for Medicaid [9] may contribute to barriers in access to health care that may continue to contribute to health inequities [5]. Concerns of the potential for limited access health care expressed in past work [9, 41], are consistent with our study findings identifying existing gaps in multiple measures of access to care. For this reason, policies seeking to bridge the gap in access to care, namely policies seeking to equip Marshallese Islanders with health insurance, are likely necessary.

Among the factors associated with not having a usual source of care, lower age (being age 18–44) and lacking health insurance served as risk factors among Marshallese Islanders. When considering several factors simultaneously, each of these factors remained as significant factors associated with not having a usual source of care. Thus, Marshallese Islanders age 18–44 and those without health insurance are particularly vulnerable. Key stakeholders can use this information to target those most at risk of facing barriers to critically important medical care which may serve to reduce potentially preventable complications.

Limitations

Several limitations warrant mentioning. The self-reported nature of diabetes prevents a full characterization of all with diabetes, where those with undiagnosed diabetes may be misclassified. Further, the cross-sectional design does not allow for causal inference. Additionally, the relatively small sample of Marshallese Islanders may not be representative of all Marshallese Islanders nationwide, globally, or those without diabetes. Further, we were restricted to the definition of forgone medical care due to cost using the single survey item that does not allow for a measure of the intensity of forgone medical care (e.g., number of times/year). Past studies have evaluated this variable in terms of cost-related barriers in access to care including comparisons across race and ethnicity nationwide [42, 43], and among those with diabetes [44] using older data. Therefore, it was appropriate for comparative purposes among Marshallese Islanders residing in the USA. Further, having a

usual source of care was also operationalized using a single survey item and as such may not be comparable to studies using other measures of having a usual source of care. These and other limitations should be considered in light of the implications in the current study. Future research should aim to recruit a larger sample of Marshallese Islanders (with/without diabetes) for more rigorous analyses (e.g., longitudinal studies) of potential health inequities facing this population. However, this was a sample drawn from the largest population of Marshallese Islanders residing in the continental US adding considerable strength to our approach.

Conclusions

Identifying inequities in accessing health care among this relatively understudied population provides actionable information that can be used, by policy makers and other key stake-holders, to implement public policy and community-based interventions aimed at ameliorating inequities in accessing necessary medical care.

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Table 1

Distribution of the target populations by key characteristics

		US noninstitutionalized population with diagnosed diabetes, 2016	US-residing Marshallese Islanders with diagnosed diabetes*	US noninstitutionalized population with diagnosed diabetes and reporting forgone medical care, 2016	US-residing Marshallese Islanders with diagnosed diabetes and reporting forgone medical care	US noninstitutionalized population with diagnosed diabetes and reporting no usual source of care, 2016	US-residing Marshallese Islanders with diagnosed diabetes and reporting no usual source of care
		Percent	Percent	Percent	Percent	Percent	Percent
Total		10.8%	*	14.6%	73.5%	6.6%	76.8
Age	18–44 years	12.0	30.6	21.1	28.5	27.6	35.9
	45–54 years	17.1	29.4	24.6	26.9	20.2	30.3
	55–64 years	27.3	25.5	32.6	28.5	30.0	21.5
	65 and older	43.6	14.5	21.7	16.1	22.1	12.3
Insurance Status	Insured	92.7	66.7	74.5	23.4	65.2	24.3
	Not insured	7.3	33.3	25.5	76.6	34.8	75.7
Marital status	Married	53.2	67.8	48.2	68.8	43.6	70.8
	Not married	46.8	32.2	51.8	31.2	56.4	29.2
Employment	Employed for wages	32.6	36.5	35.1	31.2	41.9	37.4
	Not employed	67.4	63.5	64.9	68.8	58.1	62.6
Sex	Male	50.1	41.2	45.6	36.0	58.1	40.0
	Female	49.9	58.8	54.4	64.0	41.9	60.0
Education	Did not graduate High School	22.4	58.8	33.4	60.8	36.6	56.4
	Graduated High School	77.6	41.2	66.6	39.2	63.4	43.6
Race/ethnicity	Hispanic	17.0	N/A	28.3	N/A	34.7	N/A
	Other	1.9	N/A	2.1	N/A	2.3	N/A
	American Indian or Alaska Native	1.4	N/A	1.9	N/A	3.2	N/A
	Asian	4.3	N/A	3.7	N/A	3.0	N/A
	Black or African American	15.5	N/A	16.7	N/A	16.2	N/A
	White	60.1	N/A	47.3	N/A	40.7	N/A

		US noninstitutionalized population with diagnosed diabetes, 2016	US-residing Marshallese Islanders with diagnosed diabetes*	US noninstitutionalized population with diagnosed diabetes and reporting forgone medical care, 2016	US-residing Marshallese Islanders with diagnosed diabetes and reporting forgone medical care	US noninstitutionalized population with diagnosed diabetes and reporting no usual source of care, 2016	US-residing Marshallese Islanders with diagnosed diabetes and reporting no usual source of care
		Percent	Percent	Percent	Percent	Percent	Percent
Census region	South	41.6	N/A	51.1	N/A	48.8	N/A
	North	16.8	N/A	13.3	N/A	10.4	N/A
	Midwest	20.3	N/A	16.7	N/A	14.0	N/A
	Western/Pacific	21.3	N/A	18.8	N/A	26.9	N/A

*Sample of the largest population of Marshallese Islanders residing in the USA, not necessarily nationally representative

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Table 2

Unadjusted analysis for forgone care and forgone medication among individuals age 18 years of age and older with a diagnosis of diabetes

		US noninstitutionalized population with diagnosed diabetes and reporting forgone medical care, 2016			US-residing Marshallese Islanders with diagnosed diabetes and reporting forgone medical care			US noninstitutionalized population with diagnosed diabetes and reporting no usual source of care, 2016			US-residing Marshallese Islanders with diagnosed diabetes and reporting no usual source of care		
		OR	95% confidence intervals		OR	95% confidence intervals		OR	95% confidence intervals		OR	95% confidence intervals	
Age	45–54 years versus 18–44 years	0.76*	0.65	0.90	0.91	0.46	1.79	0.47*	0.38	0.58	0.42	0.17	1.05
	55–64 years versus 18–44 years	0.61*	0.52	0.72	2.18	0.97	4.90	0.44*	0.35	0.55	0.22*	0.09	0.53
	65 and older versus 18–44 years	0.23*	0.19	0.26	1.94	0.75	5.04	0.19*	0.16	0.23	0.21*	0.08	0.57
Insurance status	Not insured versus insured	7.83*	6.62	9.27	5.17*	2.84	9.41	9.37*	7.72	11.39	5.47*	2.92	10.26
Marital status	Not married versus married	1.27*	1.14	1.41	1.88	0.95	3.71	1.51*	1.29	1.77	1.46	0.73	2.91
Employment	Not employed versus employed	0.88*	0.78	0.98	2.41*	1.36	4.27	0.65*	0.56	0.76	0.86	0.46	1.58
Sex	Female versus male	1.24*	1.12	1.37	2.32*	1.32	4.11	0.71*	0.61	0.83	0.66	0.36	1.22
Education	Less than high school versus high school or equivalent and above	1.95*	1.72	2.21	1.33	0.76	2.34	2.13*	1.79	2.54	1.63	0.91	2.92
Race/ethnicity	Hispanic vs White	2.48*	2.14	2.88	N/A	N/A	N/A	3.35*	2.77	4.05	N/A	N/A	N/A
	Other vs White	1.49*	1.10	2.02	N/A	N/A	N/A	1.88*	1.39	2.55	N/A	N/A	N/A
	American Indian or Alaska Native vs White	1.99*	1.54	2.56	N/A	N/A	N/A	3.89*	2.86	5.28	N/A	N/A	N/A
	Asian vs White	1.11	0.77	1.59	N/A	N/A	N/A	1.03	0.64	1.66	N/A	N/A	N/A
	Black or African American vs White	1.45*	1.27	1.65	N/A	N/A	N/A	1.59*	1.26	1.99	N/A	N/A	N/A
Census region	North vs South	0.60*	0.52	0.69	N/A	N/A	N/A	0.51*	0.41	0.63	N/A	N/A	N/A
	Midwest vs South	0.62*	0.55	0.70	N/A	N/A	N/A	0.57*	0.47	0.69	N/A	N/A	N/A
	Western/Pacific vs South	0.68*	0.58	0.78	N/A	N/A	N/A	1.08	0.90	1.30	N/A	N/A	N/A

*Significantly different (alpha = 0.05)

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Table 3

Multivariable analysis for forgone care and forgone medication among individuals age 18 years of age and older with a diagnosis of diabetes

		US noninstitutionalized population with diagnosed diabetes and reporting forgone medical care, 2016			US-residing Marshallese Islanders with diagnosed diabetes and reporting forgone medical care			US noninstitutionalized population with diagnosed diabetes and reporting no usual source of care, 2016			US-residing Marshallese Islanders with diagnosed diabetes and reporting no usual source of care		
		OR	95% confidence intervals		OR	95% confidence intervals		OR	95% confidence intervals		OR	95% confidence intervals	
Age	45–54 years versus 18–44 years	0.86	0.72	1.04	0.92	0.42	2.00	0.54*	0.42	0.69	0.48	0.18	1.29
	55–64 years versus 18–44 years	0.67*	0.56	0.81	2.03	0.77	5.33	0.59*	0.46	0.77	0.20*	0.07	0.58
	65 and older versus 18–44 years	0.28*	0.23	0.34	2.22	0.69	7.15	0.37*	0.28	0.48	0.18*	0.05	0.63
Insurance status	Not insured versus insured	4.81*	4.02	5.76	5.00*	2.60	9.64	6.00*	4.75	7.58	6.05*	2.97	12.31
Marital status	Not Married versus married	1.09	0.97	1.22	1.08	0.49	2.35	1.40*	1.17	1.67	1.63	0.72	3.69
Employment	Not employed versus employed	1.28*	1.13	1.46	1.07	0.51	2.25	0.87	0.72	1.06	0.83	0.35	1.96
Sex	Female versus male	1.21*	1.08	1.35	1.78	0.93	3.43	0.62*	0.52	0.74	1.12	0.54	2.32
Education	Less than high school versus high school or equivalent and above	1.41*	1.22	1.63	1.27	0.67	2.40	1.36*	1.11	1.68	1.46	0.71	3.01
Race/ethnicity	Hispanic vs White	1.52*	1.27	1.83	N/A	N/A	N/A	1.78*	1.41	2.24	N/A	N/A	N/A
	Other vs White	1.12	0.77	1.63	N/A	N/A	N/A	1.47*	1.04	2.08	N/A	N/A	N/A
	American Indian or Alaska Native vs White	1.63*	1.22	2.18	N/A	N/A	N/A	3.19*	2.31	4.40	N/A	N/A	N/A
	Asian vs White	1.24	0.81	1.88	N/A	N/A	N/A	0.92	0.54	1.55	N/A	N/A	N/A
	Black or African American vs White	1.05	0.90	1.21	N/A	N/A	N/A	1.23	0.95	1.59	N/A	N/A	N/A
Census region	North vs South	0.68*	0.58	0.80	N/A	N/A	N/A	0.60*	0.47	0.75	N/A	N/A	N/A
	Midwest vs South	0.73*	0.64	0.83	N/A	N/A	N/A	0.67*	0.55	0.83	N/A	N/A	N/A
	Western/Pacific vs South	0.63*	0.53	0.76	N/A	N/A	N/A	1.09	0.87	1.38	N/A	N/A	N/A

*Significantly different (alpha = 0.05)