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A Comparison of Seasonal Resident and Year-Round Resident Hospitalizations in Florida

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Abstract
Florida, like many "sunbelt" states, attracts a large number of temporary seasonal residents who migrate from colder climates during winter months. This research explores the characteristics of seasonal residents (i.e., "snowbirds") who were discharged from a Florida hospital. The purpose of this research was two-fold. First, we wished to determine whether hospitalizations for snowbirds could be identified in public use data files. Second, we assessed the characteristics of hospital stays for patients identified as snowbirds versus year-round resident Floridians. This observational research relies on data previously collected by Florida's Agency for Health Care Administration (AHCA) and the Florida Hospital Association (FHA). We found that snowbirds were older and healthier than year-round residents who were hospitalized in 1996, but that their inpatient care needs were similar.
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Introduction

Temperate weather makes Florida a popular winter destination for migrants from colder climates, but some of these visitors take up residency for periods that might range up to several months. As temporary residents, many depart for their home state once warmer weather returns. Better understanding of the impact of seasonality on the differential health needs of year-round residents and non-residents may allow health care providers and policymakers to match the availability of health services with health needs better throughout the year, decreasing under-utilization and over-utilization. This study was undertaken to extend the limited understanding of patients who seek inpatient care while away from home. We analyzed all adult non-maternity inpatient discharges from Florida hospitals in 1996 and compared seasonal non-resident patients (henceforth referred to as "snowbirds") to year-round Floridian residents who were hospitalized.

Florida's population on a typical day in January 1996 included approximately 971,000 non-residents, with a 12-month average of 472,000 during that calendar year (Galvez, 1997). Snowbirds typically arrive in late fall and stay until late spring. These migrants come from the United States (U.S.) and elsewhere. The Canadian Snowbird Association (www.snowbirds.org) reports that over 500,000 Canadians spend all or part of their winter in the United States. Snowbirds in the U.S. come mostly from northern-tier states, and generally migrate due south.

Prior research regarding seasonal migration and health care utilization is divisible into two main areas of inquiry. Some studies were motivated to assist planning for specific purposes, such as expansion of Veterans Health Administration (VA) facilities (Cowper & Longino, 1992). Other research is concerned with access and comparability of care for sub-populations of seasonal migrants versus other entrants into the local health care system (Marshall, Longino, Tucker, & Mullins, 1989). Snowbirds have been studied in the context of Medicare benefits and access to care while traveling (Anderson & Murphy, 1996; Buczko, 1992; McHugh & Mings, 1994). Foreign elders who winter in Florida or Arizona have been studied to determine their strategies for accessing health or hospital services in the U.S. should a need arise (Marshall et al., 1989).

Prior research for planning purposes has found that migration patterns for veterans versus non-veterans are similar. For both groups, the largest percentage in each category, over 20%, chose Florida for seasonal or permanent relocation between 1985 and 1990 (Cowper et al., 2000). These patterns are important to consider, because the VA health care system explicitly allocates its resources based on the number of veterans in an area and the number of veterans expected to move into the area.

Age and income have been identified as important predictors of the decision for seasonal migration (Hogan & Steinnes, 1998). The rate of seasonal migration varies between states, with 10.1% of elderly Arizona households reporting migration during summer months and 9.2% of Minnesota's elderly households reporting migration during the winter months (Hogan et al., 1998). Older elderly households are more likely to choose seasonal migration, although this tendency declines for the oldest households, probably due to declining health. Additionally, older seasonal migrants tend to originate from rural areas and are less likely to be employed than other elders (Hogan et al., 1998). Studies also have shown that seasonal migration is most common among elderly who are white, married, and retired, and have more education, better health status, and higher income (Longino & Marshall, 1990).

Although some seasonal migrants, particularly older adults with higher socioeconomic status, may not be considered traditionally underserved, their healthcare needs may not be fully met when seeking care while away from their permanent home. For example, their continuity of care may suffer when treated by providers who are unfamiliar with their health histories or who have limited access to their health records. Even relatively healthy older adults are more likely to suffer from a greater range of complex, chronic conditions than the younger population. Snowbirds may hesitate or delay care-seeking behavior due to lack of familiarity with local providers or because of negative economic implications related to seeing providers outside of their home community, causing greater risk of preventable hospitalization. Many Medigap policies require different cost-sharing responsibility for care received in other states. Medicare Advantage (formerly Medicare+Choice) policies offer limited benefits and extensive cost-sharing responsibility for care sought outside the network.

In the present study, we examined whether snowbirds who received inpatient care in Florida do so in ways that are systematically different from year-round residents. Although the majority of Florida's snowbirds are unlikely to require inpatient hospital services, this issue warrants consideration for several reasons. For example, the insurance status or coverage of these patients might be impacted by travel. Fragmentation of care delivery or post hospital follow-up can result in additional, duplicative, unnecessary, or otherwise inefficient treatment. Given that most hospitalizations for snowbirds are likely to be unscheduled, we hypothesized that the diagnostic and procedural conditions for these patients will be more related to urgent or emergent delivery of care compared to permanent residents.

Design and Methods

The purpose of this research was two-fold. First, we wished to determine whether hospitalizations for snowbirds could be identified in public use data files. Second, we assessed the characteristics of hospital stays for patients identified as snowbirds versus year-round Florida residents.

Data sources included the Florida Discharge Data (FDD) (State Center for Health Statistics, 1996), the Florida Hospital Association (FHA) financial survey (FHA, 1996), and the Area Resource File (ARF) (Bureau of Health Professions, 1999). The FDD included all inpatient discharges between January 1 and December 31 of 1996, with an initial sample size of 1,930,830 hospital stays. The FHA data provide financial and ownership information for the 205 acute care facilities operating in Florida. We obtained additional local area information for Florida's 67 counties from the ARF.

We excluded discharges associated with maternity care and newborn delivery from the analysis, as these cases are rarely associated with snowbirds. We also excluded discharges for children under age 18, because minors are unlikely to be making travel or care decisions. We included hospitalizations for elders over age 65 along with those for younger adults, as many elders who seasonally migrate do so with younger spouses or family members (Gendell, 2001). The resulting data set included 1,115,631 hospital discharges.

We defined snowbirds using two pieces on information from the FDD file. For each observed discharge, we identified: (1) state of residence and (2) calendar year quarter the patient was discharged from the facility. Seasonal discharges were defined as those that occurred during either quarter 1 (January to March) or quarter 4 (October to December). Reported residence in states other than Florida or its adjacent states, Georgia and Alabama, were categorized as "non-residents" of Florida. Adjacent state residents were excluded from the study because these patients might live close to the Florida border and consider one or more hospitals in Florida to be part of their local market area for either routine or tertiary care (Buczko, 1994). Due to limitations in the data, foreign visitors could not be adequately distinguished from other non-residents.

Other variables of interest included the demographic characteristics of gender, age, and race; expected payer source including Medicare, Medicaid, VA, private insurance, or self-pay; type of admission as scheduled, urgent, or emergent; type of Diagnosis Related Group (DRG), which we grouped as basic medical, complex medical, obstetrics, general surgery, specialty surgery; ICD-9-CM diagnosis and procedure codes; total charges for the hospital stay; and short-term outcomes of mortality, length of stay, and discharge location.

Facility characteristics obtained from the FHA and ARF data included: urban or rural county location; region of the state as the Panhandle, North, Central, West, or South; whether or not the hospital provides acute care services; teaching status; and ownership status (government, non-profit, and for-profit). Other facility characteristics included Medicare case-mix measures; total annual discharges; and the number and percentage of discharges for non-residents and snowbirds.

Analytic methods included a quantitative description of the resident versus snowbird population and tests of statistical differences between the two groups. We included t-tests, χ^2 tests of

association, and multiple logistic regression analysis. Whereas snowbirds were identified as being hospitalized in two particular quarters, the analysis includes all calendar year discharges.

We classified 35,415 non-resident discharges during the calendar year. Of these, 23,208 occurred during quarters 1 or 4. Based on the sample of 1.1 million cases, snowbirds represented about 2% of Florida's hospitalizations in calendar 1996.

Results

Table 1 presents the comparison of demographics, types of admission, and diagnostic characteristics of snowbirds versus year-round residents who were discharged from a Florida hospital. Table 2 provides facility and geographic characteristics based on the two groups of discharges. Due to the large number of cases in both samples, even small differences between the groups were statistically significant at $\leq .01$. Therefore, we focus on noting the substantive differences between the two groups. Snowbirds were older -- the average age was 67 versus 63 for year-round residents. However, when examined across age categories, 69% of snowbirds were under age 74 versus 66% of year-round residents. Snowbirds were more likely to be white, male, or admitted for emergency care compared to residents. Numbers of diagnoses and procedures were similar for the two groups. Snowbirds had approximately 1/2-day shorter stays, and had a higher percentage of discharges to home than did year-round Florida residents. Both groups had similar rates of Medicare coverage. Among those without private or Medicare coverage, Medicaid was listed as the expected payer for 7% of residents. Among snowbirds, 8% were either uninsured or expected to pay for care themselves. From these data we could not ascertain whether payment was collected from the expected payer after discharge.

Table 2 details the travel locations and destinations of hospitalized seasonal non-residents. Over 70% of these discharges were from facilities located in either South or West Florida. Compared to year-round Florida residents, snowbirds tended to use facilities that were either non-profit and/or government-owned. The average number of non-residents treated at facilities chosen by snowbirds was higher than that chosen by year-round residents, suggesting that non-residents tend to be directed to certain locations and certain hospitals. Despite differences in hospital choice, the overall hospital case mix indices were similar for the two groups.

Tables 3, 4 and 5 provide rankings and rates per 1000 discharges for the most common DRG codes, ICD-9-CM diagnosis codes, and ICD-9-CM procedure codes respectively for the two groups. There is striking similarity across the two groups in all three tables. However, in cases of divergence, DRG codes for snowbirds were generally related to emergent medical conditions and heart disease versus scheduled surgery or treatment for mental illness. Incidence rates for the diagnoses and procedures are reported for the two groups.

Due to information in Table 1 that suggested comparable mortality rates for the two groups of patients, we conducted a logistic regression analysis to explore whether this similarity would persist after controlling for characteristics related to demographics, diagnoses, insurance, and the facility. DRG groupings were used to characterize the hospital stay as it relates to a medical or surgical diagnosis and the relative complexity of that diagnosis. These groupings have been described in detail elsewhere (Radcliff, Brasure, Moscovice, & Stensland, 2002). Model fit was tested using a C statistic, and suggested that over 78% of cases were correctly categorized based on the models we established. Table 6 presents the odds ratios and 99% confidence range for two regression models. Model 1 excluded whether the admission was urgent or emergent, whereas model 2 included those two indicator variables. For model 1, the snowbirds variable was not statistically significant; the odds ratio was 0.94 evaluated at the mean, suggesting that the odds of in-hospital death are similar for both groups even after controlling for other factors, such as length of stay. However, when we control for urgent and emergent admission (model 2), the odds ratio drops to 0.91 and is statistically significant. Other variables that were predictive of increased risk of mortality included older age, with a risk of death rising non-linearly with increasing age, Medicaid or uninsured status, male gender, urgent admission, and complex medical diagnoses. More procedures, diagnoses, and treatment in government-owned, rural, or teaching hospitals also were associated with higher odds of death in the facility. Risk of death in hospitals located in Central and North Florida was higher compared to that in other regions of the state (model 2).

Discussion

We found that snowbirds were older and healthier than residents who were hospitalized in 1996, but that their care needs were similar. Nevertheless, there were distinct patterns for the two groups. In particular, the geographic distribution of snowbirds varied from that of year-round residents and was concentrated in facilities that treated other non-residents. This occurrence was, perhaps, because certain areas attract tourists and snowbirds; the hospital that treated more snowbirds than any other is

located in Orlando, a popular tourist destination. However, the hospital with the greatest proportion of snowbirds discharged is located in the Florida Keys. Facilities in North Florida had the lowest component of non-resident discharges.

Discharge status for snowbirds is better than that of residents. Unadjusted comparisons showed a small but significant difference in in-hospital mortality and higher rates of discharge to home for snowbirds versus year-round Florida residents. This similarity in the risk of death persisted even after controlling for other factors, with only the regression model that accounts for urgent or emergent admission indicating a significantly lower odds ratio of in-hospital mortality for snowbirds. We suspect that snowbirds are a healthier population prior to hospitalization, evidenced by their ability to travel.

This study has several limitations. Our definition of a snowbird is based on information contained in the hospital discharge record and depends on patients reporting their permanent home address at the time of hospitalization. We were unable to assess the magnitude of this issue with the data available. However, we posit that patients reporting non-Florida addresses were likely not residing in Florida, thus biasing the study toward misclassifying some snowbirds as residents. We may be capturing short-term tourist travelers more accurately than long-term non-residents within our seasonal migrant population. In addition, these results may not be generalizable to other states or years.

This research offers insight into inpatient care patterns for snowbirds. As the average age of the U.S. population continues to increase, the impact of seasonal migration on the delivery of health care will become more important and, assuming current migratory trends continue, more concentrated in Sunbelt states like Florida. Greater understanding of the impact of snowbirds on the health system can guide patients, hospitals, and payers to create policies to reduce fragmentation, improve quality, and minimize inefficiency in services delivery.

Future studies should include measures to adjust for underlying health status and capture differences in quality of care between snowbirds and residents. It also would be important to examine the impact that seasonal demand has on capacity planning at hospitals that attract significant numbers of snowbirds compared to those hospitals that treat few snowbirds.

Table 1: Comparison of Discharge Characteristics

Discharge Characteristics		**Year-round FL Residents**	**Snowbirds**
Age Distribution (%)	Age 18 to 64	43*	37
	Age 65 to 74	22	32*
	Age 75 to 84	24	24
	Age 85 and over	12*	7
Non-white (%)		24*	10
Female (%)		53*	43
Emergency Admission (%)		60	66*
Average Number of Diagnosis Codes (ICD-9-CM)		5.8*	5.6
Average Number of Procedure Codes (ICD-9-CM)		1.2	1.3*
Average Total Charges		$ 15 261	$ 15 320*
In-hospital Mortality (%)		4.3*	4.0
Average Length of Stay (Days)		5.8*	5.2
Discharged to Home (%)		65	73*
Discharged to Institution (%)		16*	9
Medicare expected to pay (%)		56	56
Medicaid expected to pay (%)		7*	1
Self-Pay / Uninsured (%)		7	8*

* Denotes differences that are statistically significant at $p \leq 0.01$.

Table 2: Comparison of Hospital Facility Characteristics

Facility Characteristics	**Year-round FL Residents**	**Snowbirds**
Located in an urban county (Average %)	95	96*
Located in Central Florida (Average %)	11	13*
Located in North Florida (Average %)	16*	11
Located in Florida Panhandle (Average %)	7*	5
Located in South Florida (Average %)	36*	34
Located in West Florida (Average %)	29	37*
Acute Care Facility (Average %)	95	97*
Teaching Facility (Average %)	8	10*
For-Profit Ownership (Average %)	38*	27
Government Ownership (Average %)	14	18*
Non-Profit Ownership (Average %)	47	54*
Hospital Overall PPS Case Mix (Average %)	1.55	1.56*
Total Annual Non-resident Discharges (Average Number)	316	541*
Percent Non-resident Discharges (Average %)	1.8	3.1*
Total Annual Discharges (Average Number)	17 203	18 263*
Total Annual Snowbird Discharges (Average Number)	205	368*

* Denotes differences that are statistically significant at $p \leq 0.01$.

Table 3: Most Frequent Diagnosis Related Group (DRG) Codes by Type of Patient

Ranking	Florida Year-round Residents		Seasonal Non-Residents	
	DRG Description (Code)	Cases Per 1000	DRG Description (Code)	Cases Per 1000
1	Heart Failure and Shock (127)	54	Heart Failure and Shock (127)	53
2	Specific Cerebrovascular Disorders except TIA (14)	32	Specific Cerebrovascular Disorders except TIA (14)	39
3	Chronic Obstructive Pulmonary Disease (COPD) (88)	31	Simple Pneumonia and Pleurisy (89)	31
4	*Psychoses (430)*	30	Chronic Obstructive Pulmonary Disease (COPD) (88)	31
5	Simple Pneumonia and Pleurisy (89)	24	Percutaneous Cardiovascular Procedures (112)	31
6	*Septicemia (416)*	22	*Atherosclerosis (132)*	27
7	Percutaneous Cardiovascular Procedures (112)	22	*Circulatory Disorders with AMI and CV Complication-Discharged Alive (121)*	25
8	*Esophagitis, Gastroent, and Misc. Digestive Disorders (182)*	21	Chest Pain (143)	23
9	Chest Pain (143)	21	*Cardiac Arrythmia and Conduction Disorders (138)*	23
10	*GI Hemorrhage(174)*	21	*Cardiac Catheterization and Complex Diagnosis (124)*	22

Note: Text in italics represents items that are unique to a single patient type

Table 4: Most Frequent Principal Diagnosis Codes (ICD-9-CM) by Type of Patient

Ranking	Florida Year-round Residents		Seasonal Non-Residents	
	ICD-9 Code Description (Code)	Cases per 1000	ICD-9 Code Description (Code)	Cases per 1000
1	Heart Failure (428)	53	Coronary Atherosclerosis of Native Artery (414.01)	58
2	Coronary Atherosclerosis of Native Artery (414.01)	47	Heart Failure (428)	54
3	Obstructive Chronic Bronchitis with Acute Exacerbation (491.21)	23	Pneumonia, organism unspecified (486)	30
4	Pneumonia, organism unspecified (486)	23	Acute Myocardial Infarction - subendocardial infarction (410.71)	26
5	Chest Pain (786.5)	22	Chest Pain (786.5)	24
6	Cerebral artery occlusion, unspecified (434.91)	17	Obstructive Chronic Bronchitis with Acute Exacerbation (491.21)	23
7	Acute Myocardial Infarction - subendocardial infarction (410.71)	16	Cerebral artery occlusion, unspecified (434.91)	20
8	*Respiratory Failure (518.81)*	14	Cardiac Dysrythmias - Atrial Fibrillation (427.31)	19
9	Cardiac Dysrythmias - Atrial Fibrillation (427.31)	13	*Acute Myocardial Infarction - inferior wall (410.41)*	16
10	*Disorders of fluid, electrolyte, and acid base balance (276.5)*	12	*Intermediate Coronary Syndrome (Impending infarction; Preinfarction angina; Preinfarction syndrome; Unstable angina) (411.1)*	15

Note: Text in italics represents items that are unique to a single patient type

Table 5: Most Frequent Principal Procedure Codes (ICD-9-CM) by Type of Patient

	Florida Year-round Residents		Seasonal Non-Residents	
Ranking	**ICD-9 Code Description (Code)**	**Cases per 1000**	**ICD-9 Code Description (Code)**	**Cases per 1000**
1	Left heart cardiac catheterization (37.22)	51	Left heart cardiac catheterization (37.22)	63
2	Esophagogastroduodenoscopy [EGD] with closed biopsy (45.16)	43	Single vessel percutaneous transluminal coronary angioplasty [PTCA] or coronary atherectomy without mention of thrombolytic agent (36.01)	50
3	Single vessel percutaneous transluminal coronary angioplasty [PTCA] or coronary atherectomy without mention of thrombolytic agent (36.01)	35	Esophagogastroduodenoscopy [EGD] with closed biopsy (45.16)	43
4	Other endoscopy of small intestine (45.13)	25	Combined right and left heart cardiac catheterization (37.23)	35
5	Combined right and left heart cardiac catheterization (37.23)	24	Open reduction of fracture with internal fixation (79.35)	28
6	Open reduction of fracture with internal fixation (79.35)	24	*Continuous mechanical ventilation (96.71)*	26
7	Laproscopic cholecystectomy (51.23)	23	Other endoscopy of small intestine (45.13)	23
8	*Continuous mechanical ventilation for less than 96 consecutive hours (96.71)*	23	Laproscopic cholecystectomy (51.23)	23
9	*Venous catheterization, not elsewhere classified (38.93)*	19	*Computerized axial tomography of head (C.A.T. scan of head) (87.03)*	17
10	*Excisional debridement of wound, infection, or burn (86.22)*	18	*Aortocoronary bypass of three coronary arteries (36.13)*	13

Note: Text in italics represents items that are unique to a single patient type

Table 6: Logistic Regression Results Predicting In-Hospital Mortality

Variable Effects	Regression Model 1			Regression Model 2		
	Point Estimate Odds Ratio	95% Confidence Interval		Point Estimate Odds Ratio	95% Confidence Interval	
		Lower Bound	Upper Bound		Lower Bound	Upper Bound
Snowbird	0.940	0.872	1.012	0.918*	0.852	0.989
Medicare [a]	0.851*	0.825	0.878	0.857*	0.831	0.884
Medicaid [a]	1.286*	1.213	1.364	1.273*	1.200	1.350
Uninsured [a]	1.368*	1.288	1.451	1.333*	1.256	1.415
Female	0.818*	0.800	0.835	0.819*	0.801	0.837
Age	1.035*	1.034	1.036	1.035*	1.034	1.036
White Race	0.902*	0.874	0.931	0.916*	0.888	0.945
Complex Medical DRG [b]	2.051*	1.997	2.106	2.042*	1.989	2.098
General Surgery DRG [b]	0.885*	0.846	0.927	0.902*	0.862	0.945
Specialty Surgery DRG [b]	0.506*	0.484	0.530	0.521*	0.498	0.545
Total number of diagnoses (ICD-9)	1.245*	1.239	1.251	1.241*	1.235	1.247
Total number of procedures (ICD-9)	1.286*	1.279	1.293	1.288*	1.280	1.295
Teaching Hospital	1.223*	1.164	1.285	1.150*	1.094	1.208
Government-owned Hospital	1.140*	1.105	1.175	1.160*	1.121	1.199
Rural Hospital	1.270*	1.053	1.531	1.028*	1.003	1.053
Central Florida [d]	0.821*	0.789	0.855	1.264*	1.047	1.525
South Florida [d]	0.933*	0.902	0.965	0.843*	0.810	0.878
Florida Panhandle [d]	0.902*	0.861	0.946	0.980	0.947	1.014
West Florida [d]	0.864*	0.837	0.891	0.931*	0.888	0.975
Urgent Admission [e]				0.900*	0.872	0.929
Emergency Admission [e]				0.873	0.691	1.104

* Denotes statistical significance of at least $p<0.05$

a. The referent category is private health insurance
b. The referent category is a basic medical Diagnosis Related Group (DRG) based on criteria defined in other research (see Radcliff et al. 2003 for a detailed description)
c. The referent category is private or corporate ownership (non-government)
d. The referent category is hospital location in North Florida
e. The reference category is scheduled admission.

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