

The Demographics of Whole-Body Donors in Wisconsin

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ABSTRACT

Background: Individuals who donate their bodies to academic, whole-body donation programs support health science education, training, and research. This is the first report on Wisconsin whole-body donor demographics and the extent to which donors represent the state population.

Methods: Donor demographic data from 2016 through 2021 were collected from death certificate worksheets and compared with Wisconsin population data from the US Census Bureau and state health statistics.

Results: Most donors were non-Hispanic White individuals, did not have a college degree, and did not work in health care. The median age at death was 86 years. Twenty-eight percent of donors served in the armed forces. Donors were not representative of the Wisconsin population in age, race, ethnicity, or military service.

Discussion: Whole-body donors provide an invaluable resource for health science education and research. Understanding donor demographics is an important first step in examining diversity and representation within Wisconsin's body donation programs.

BACKGROUND

Whole-body donation is a critical component of health professions education. Thousands of health science students, researchers, and professionals learn from whole-body donors during their training and careers. In Wisconsin, there are 2 academic, whole-body donor programs to which individuals may donate: the University of Wisconsin School of Medicine and Public Health Body Donor Program (UWBDP) in Madison and the Medical

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College of Wisconsin Anatomical Gift Registry (AGR) in Milwaukee.

Both programs serve as educational and biomedical research resources for health science students at public and private colleges and universities in Wisconsin. Anatomy and physiology courses that utilize donated bodies educate medical, physician assistant, dental, pharmacy, physical therapy, occupational therapy, and undergraduate students, as well as medical residents. Both programs greatly value the individuals who donate their bodies, and every year, faculty, staff, and students at each program express their gratitude during body donor memorial ceremonies attended by donors' families and loved ones.

Like standardized patients in simulated clinical scenarios, whole-body donors are an important population who represent students' future patients. Despite the tremendous gift that body donors provide, little is known about the population of individuals who donate their bodies to these programs and how representative they are of the Wisconsin population. This collaboration between UWBDP and AGR is the first study on the demographics of whole-body donors in Wisconsin.

METHODS

Donor demographic data were collected from the death certificate worksheet (DCW) for each Wisconsin resident who died from January 1, 2016, through December 31, 2021, and donated their body to UWBDP or AGR. All personally identifiable information was removed from datasets prior to analysis. Wisconsin population data were collected from the US Census Bureau 2020 Decennial Census,¹ the 2020 American Community Survey 5-Year Estimate,² and the Wisconsin Interactive Statistics on Health Query System.³

Table. Decedent (Donor) Statistics and Results (n=1224)

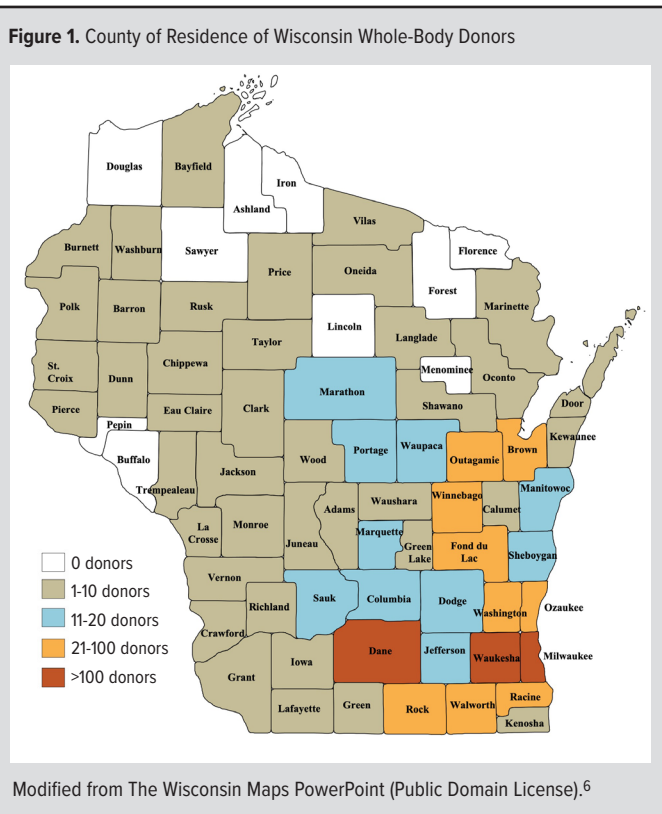
Decedent Statistic	How Statistic Is Reported	Donor Sample Data	Wisconsin Census Data	P value
Sex	F or M	Female, 662 (54.1%); male, 562 (45.9%)	Female, 50.2%; male, 49.8%	.0007
Age at death	Individuals must be 18 years or older to donate male, 84 (74-89)	All, 86 (76-91); female, 87 (78-93);	All 78; female 82; male 75	< .001
County of residence	County in which the donor was living at time of death	Top 3: Milwaukee County, 293 (23.9%); Waukesha County, 164 (13.4%); Dane County, 140 (11.5%)	—	—
Hispanic/Spanish/Latino origin (ethnicity)	Check 1 or more boxes: Not Hispanic/Spanish/Latina(o); Mexican/Mexican American/Chicana(o); Puerto Rican; Unknown; Cuban; Other Hispanic/Spanish/Latina(o)	Not Hispanic/Spanish/Latina(o), 1206 (99.5%); of Hispanic/Spanish/Latina(o) origin, 6 (0.5%)	Not Hispanic/Spanish/Latina(o), 92.4%; of Hispanic/Spanish/Latina(o) origin, 7.6%	< .001
Race ^a	Check 1 or more boxes: White, Black or African American, American Indian or Alaskan Native, Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, Laotian, Hmong, Other Asian Specify, Native Hawaiian, Guamanian or Chamorro, Samoan, Other Pacific Islander, Other, or unknown	White 1196 (98.8%); Black or African American, 11 (0.9%), Asian 4 (0.3%)	White, 80.4%; Black or African American, 6.4%; Asian, 3%	< .001
Education	Check a box: 8th grade or less; 9th-12th grade no diploma; high school graduate or GED completed; some college credit, but no degree; associate degree; bachelor's degree; master's degree; doctorate or professional degree; or unknown	Associate degree or less, 844 (69.6%); bachelor's degree or more, 368 (30.4%)	Bachelor's degree or more, 30.8%; associate degree or less, 69.2%	.765
Usual occupation	Write-in: Occupation held for the longest period of time; cannot use "Retired"	Top 2: Office and Administration, 17.6%; Construction and Trades, ^b 14.6%; and Healthcare, ^c 7%	—	—
Armed forces service	Check a box: Yes, no, unknown	Yes, 344 (28.1%); no 880 (71.9%)	Yes 5.9%; no 94.1%	< .001

Donor sample data is reported as N (%) or median (IQR).

^aP values are Holm-adjusted for multiple testing within the same variable.

^bConstruction and Trades includes 3 major groups:⁵ Construction and Extraction; Installation, Maintenance, and Repair; and Production Occupations.

^cHealthcare includes 2 major groups:⁵ Healthcare Practitioners and Technical Occupations, and Healthcare Support Occupations.



The demographic data, reported as decedent statistics on the DCW, included sex, age at death, county of residence, Hispanic/Spanish/Latino ethnicity, race, education, usual occupation (occupation held for the longest period of time; not "Retired"), and armed forces service. Demographic variables are not self-reported because the DCW is completed by a funeral director in consultation with the decedent's responsible party, typically the legal next of kin. The DCW forms are completed through the Statewide Vital Records Information System (SVRIS).⁴ The DCW cannot be submitted if any decedent information is reported in an incorrect format or if a box is left blank.

Due to the variety of occupations reported on the DCW, we sorted usual occupation into broader categories based on the US Bureau of Labor Statistics Standard Occupational Classification System.⁵

P values are reported from tests of a single proportion or Wilcoxon signed rank test against the Census data statistic as the null hypothesis for the following donor variables: sex, age at death, ethnicity, race, education, and armed forces service. The significance threshold was set at $P < .001$. County of residence and occupation were not directly compared in this study.

RESULTS

From 2016 through 2021, 1224 whole-body donations were accepted: 565 individuals donated their bodies to UWBDP and 659 to AGR.

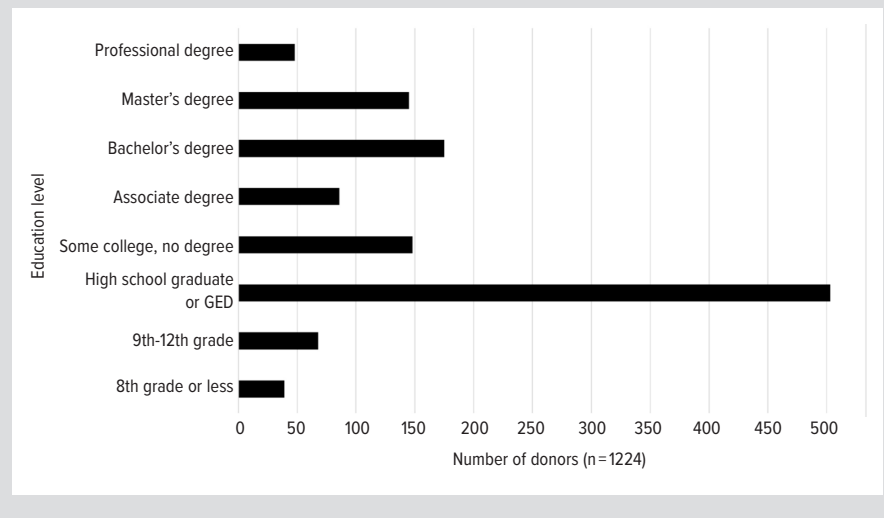
Females accounted for 54% of the donor sample; males accounted for 46% (Table). This female-to-male ratio is not significantly different from the Wisconsin population (Table). The median age at death was 87 years for female donors and 84 years for male donors—both significantly higher than the median age at death in Wisconsin (78 years; Table). Whole-body donors came from across the state, with many having resided in the 3 most populous counties: Milwaukee (24%), Waukesha (13%), and Dane (12%; Figure 1). Almost all donors (99.5%) were of non-Hispanic/Spanish/Latina(o) ethnicity (Table). The majority of donors (98.8%) were White, 0.9% were Black or African American, and 0.3% were Asian (Table). The Asian racial categories listed on the DCW (eg, Asian Indian, Chinese, Filipino; Table) were combined into a broader Asian category so that the donor data could be compared directly to state Census data. No other racial categories were represented among donors during 2016-2021. This racial distribution is significantly different from that of the Wisconsin population, which is approximately 80.4% White, 6.4% Black or African American, and 3% Asian.

Most whole-body donors did not have a college degree or work in health care; 41% graduated high school or completed a GED (Figure 2). Additionally, 30% attained a bachelor's degree or higher, which is not significantly different from the 30% of Wisconsinites who hold a bachelor's degree or higher (Figure 2; Table). The top 2 occupation categories were office and administrative support (17.6%) and construction and trades (14.6%), with only 7% of donors having worked in health care (Table). Lastly, 28% of Wisconsin whole-body donors were reported to have served in the armed forces, significantly more than the approximately 5.9% of Wisconsinites who served (Table).

DISCUSSION

This is the first report on Wisconsin whole-body donors and the extent to which they represent the state population. Individuals who donate their bodies to the 2 academic programs—UWBDP and AGR—are socially and economically diverse but not ethnically or racially diverse. The statewide impact of willed body donation is clear, as donors resided in nearly every county in Wisconsin. Donors were representative of the state population in terms of female-to-male ratio and some aspects of educational attainment;

Figure 2. Education Level of Wisconsin Whole-Body Donors



however, they were not representative in age at death, ethnicity, race, and armed forces service.

Our data indicate that students are learning from donors who represent an older population. We suspect this is because younger individuals may choose organ donation rather than whole-body donation. The older age of donors presents opportunities to discuss with students postmenopausal and other age-related changes in the body, as well as care-related needs of older populations.

Similarly, students are learning from donors who are predominantly non-Hispanic White individuals. Health professions students can make value judgements about the bodies they dissect in the anatomy lab⁷ and may hold false beliefs about biological differences among socially defined racial groups.⁸ To address ethnic and racial diversity in the anatomy lab, we recommend reinforcing that students should expect to see anatomical variation among donors and that this variation does not align with racial categories. Additionally, this presents an opportunity to discuss with students the many historic, cultural, religious,⁹ and personal factors that influence decisions about body donation.

More than a quarter of the donors were veterans, many of whom served in World War II, the Korean War, or the Vietnam War. Median donor age suggests that donors were too young for service in World War I. However, men aged 18 to 45 years were required to register for the first peacetime draft starting in 1940, and military conscription continued until 1973.¹⁰ We suggest that historic wartime induction into military service and the age of many of our donors from 1940 through 1973 account for the large percentage of veterans in the donor sample.

CONCLUSIONS

Whole-body donors serve as unparalleled educators for the training of health science students in Wisconsin. Their immense gifts benefit thousands of students, residents, and medical profession-

als each year. Body donation also helps drive advances in biomedical research focused on mechanisms of disease and injury and the development of clinical and surgical techniques. We aim to increase awareness of body donation to better serve both our community of learners and the Wisconsin population. A goal of health care education is to train a diverse group of students and trainees reflective of the diverse patient populations they will serve. Analyzing the demographics of body donors is a first step toward understanding diversity and representation within this unique population in Wisconsin.

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