A Department of Motor Vehicles intervention yields moderate increases in donor designation rates

Context—Nearly all persons (37% of public) who have a joined an organ donor registry in the United States have done so through their Department of Motor Vehicles (DMV) office, which is an underused venue for organ donation campaigns.
Objective—To evaluate the effectiveness of a statewide DMV-based intervention to increase donor designation rates.
Design and Setting—Thirty DMV offices in Florida were randomly assigned to receive usual care (n = 15) or an organ donation intervention (n = 15).
Measurement and Primary Outcome—Donor designation rates were assessed at baseline (before the intervention), during the intervention, and at follow-up.
Results—When baseline donor designation rate and region were controlled for, the intervention group showed a significantly higher aggregate monthly donor designation rate than the usual care group during the intervention phase of the study ($P = .02$). Donor designation rates did not differ significantly ($P = .13$) during the follow-up phase. Lower donor designations rates were significantly associated with DMV service regions with more minorities, less education, and lower income.
Conclusion—We conclude that a comprehensive DMV-based intervention focused on staff education and direct interactions with the public could yield modest increases in donor designation rates. (*Progress in Transplantation.* 2012;22:18-24)

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The gap between the number of persons in need of transplantation and the number of organs donated continues to widen.[1] Despite very favorable attitudes toward organ donation,[2] only 37% of the public has joined an organ donor registry.[3] Enrollment in a donor registry is important because family members are more likely to consent to organ donation when the decedent's donation wishes are known.[4-6] In light of this link between donor designation and eventual organ donation, organ procurement organizations (OPOs) have focused public education efforts on increasing enrollment in state organ donor registries.

For several reasons, the Department of Motor Vehicles (DMV) is a useful venue for public education campaigns to increase donor designation rates.[7-10] First, approximately 97% of persons who registered as organ

donors in the United States did so through a DMV, when obtaining or renewing a driver's license.[3] Second, the DMV office is often the first time an individual is formally asked to consider organ donation, so providing education to both the questioner (DMV clerk) and the customer (the public) to increase knowledge and awareness about organ donation is important. Third, the DMV is a familiar venue as virtually everyone conducts DMV-based transactions during their lifetime. Fourth, DMV offices can provide immediate feedback (in the form of a registry) about the effectiveness of public education campaigns. Because of these potential advantages, the final report of the US Department of Health and Human Services' conference on guidelines for donor registry development[11] emphasized the need to partner with DMVs and their administrators to inform and motivate staff about the benefits of organ donation, to ensure that staff can answer basic questions about organ donation, and to make organ donation information available to the public at this venue.

Few published studies have examined the effectiveness of DMV-based organ donation interventions. In 1 unpublished study, Intermountain Donor Services in Utah used several strategies to increase enrollment in the statewide donor registry in the DMV office.[12] They used media campaigns, direct mailings, community outreach events, and workplace partnerships to promote the registry among individuals before those persons made the donation decision at the DMV office. In a little more than 2 years, the percentage of licensed drivers enrolled in the donor registry increased from 54% to 63%. Most impressively, during the study period, the actual donation consent rate increased from 66% to 71%, with 97% family consent rates for those potential donors in the registry (vs 61% when the potential donor was not in the registry).

Harrison and colleagues[7-9] have provided the most robust evidence for the effectiveness of DMV-based organ donation campaigns. In 1 study,[7] researchers provided a 1-hour training intervention to DMV clerks that educated them about a new donor registry, organ donation facts and myths, and effective communication strategies for interacting with the public. They not only found that training increased DMV clerks' knowledge, attitudes, beliefs, and behavioral intention toward organ donation, but that donor designation rates were significantly higher in counties where clerks received training than in counties where clerks did not receive the intervention. Harrison et al[8] also implemented a multicomponent organ donation intervention in 3 Michigan counties. Their intervention included targeted media ads, point-of-decision materials in the DMV offices, and interpersonal interactions between organ donation volunteers and DMV customers. Overall, the 3 counties experienced a 200% to 400% increase in organ donor registrations, which compared favorably with the stable statewide donor registration trends. Finally, Harrison et al[9] replicated the latter study in 2 predominantly African American counties in Michigan and found that the intervention also led to substantial increases in organ donor registrations among African Americans. Clearly, these findings highlight the potential utility of DMV offices as a venue for delivering interventions designed to increase registration as an organ donor.

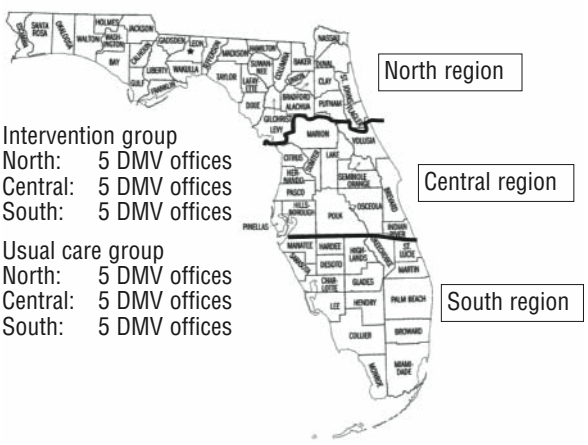

Figure 1 Distribution across Florida regions of 30 offices of the Department of Motor Vehicles (DMV) randomly assigned to the intervention group or the usual care group.

The primary objective of the present study was to evaluate the effectiveness of a comprehensive DMV-based intervention to increase donation designations. We hypothesized that DMV offices receiving the intervention would show significant increases in donor designation rates compared with DMV offices that did not receive the intervention.

Methods

Participants

DMV offices in Florida served as participants for this study. Thirty DMV offices were identified for study participation by state DMV administrators and then randomly assigned by the study investigators to receive the study intervention (n = 15) or usual care (n = 15). Because of variability in population demographics, randomization was stratified by Florida region (Figure 1). Collectively, these 30 offices service a total catchment of approximately 3 million people, or 20% of all licensed drivers in Florida.

Specification of the Intervention

Historically, Donate Life Florida has provided DMV offices with standard organ donation brochures or pamphlets for display in their waiting areas and distribution to their customers. All DMV offices enrolled in the study displayed the same organ donation print materials, regardless of group assignment. For DMV

offices assigned to usual care, this was all that was provided, that is, a passive display of organ donation materials.

DMV offices assigned to the intervention group also displayed organ donation materials, but received several additional intervention components that were not made available to offices in the usual care group. For instance, DMV offices assigned to the intervention group received a letter from the state director about the importance of organ donation, the role of the DMV in organ donation, and the administration's commitment to the study. DMV staff also participated in "lunch and learn" sessions, which were led by a Donate Life Florida liaison and included participation by a donor family representative and/or a transplant recipient. These sessions emphasized the need for organ donation and transplantation in Florida, addressed common myths about organ donation, and highlighted the DMV staff's role in facilitating transplantation. Also, a "friendly competition" was launched among the DMV offices assigned to the intervention group and they were given feedback about organ donor sign-ups in their offices. The Donate Life Florida liaison visited each intervention group office at least once per month during the 3-month intervention period to answer staff questions and to remind staff of their role in facilitating organ donation. Staff were provided with Donate Life Florida t-shirts (and encouraged to wear the shirts on Fridays) and lapel pins (which they were encouraged to wear daily) during the intervention period. In addition to the provision of organ donation materials for display in the waiting area, volunteers staffed information tables at various points throughout the intervention period for people to visit while they waited for their transaction to be completed. These tables were staffed by Donate Life Florida staff, organ donor family members, and/or transplant recipients and were designed to "put a face" on organ donation and transplantation. They were generally representatives from the local community and they were trained to respectfully inform customers of the need for more organ donors, to correct false information or inaccurate beliefs about organ donation, and to encourage customers to sign up as organ donors. The intervention was conducted during a 3-month period and then withdrawn, although all 30 DMV offices continued to receive organ donation brochures for display.

Data Collection and Timing

We received monthly state-generated reports of the total number of licensed drivers and donor designations per DMV office throughout Florida. Monthly data reports were collected during 3 distinct assessment periods: (1) baseline phase: 6-month aggregate percentage of donor designations before the intervention, (2) intervention phase: 3-month aggregate percentage of donor designations during the intervention, and (3) follow-up phase: 8-month aggregate percentage of donor designations after withdrawal of the intervention.

One important caveat about the data collection is noteworthy. Before the study started, the Florida Senate passed legislation authorizing the development of a statewide online organ and tissue donor registry, which was to have served as the primary source of data collection for this study. However, this legislation was vetoed by the governor, and we had to rely on existing processes for collecting monthly data reports, which did not provide the rich level of detail we were anticipating. Several months into the project, however, legislation to establish the statewide registry was finally enacted and we were able to integrate these 2 data management formats.

US Census data also were gathered for the distinct geographic regions represented by the DMV offices participating in the study. Specifically, we collected information about the percentage of minorities, the percentage of individuals with a college degree, and the per capita income for the general population in each of the 30 regions serviced by the DMV offices in the study.

Statistical Analysis

On a monthly basis, we calculated the percentage of individuals registered as organ donors for each DMV office. We then aggregated these percentages across each of the assessment phases (baseline, intervention, follow-up) and calculated means by group within regions. Group and region differences in donor designation rates at baseline were examined by using 1-way analysis of variance. The relationship between baseline donor designation and census data was examined by calculating Pearson product-moment correlation coefficients. For the analysis predicting the primary outcome measure (percentage of donor designations) based on group status, analysis of covariance was used with the respective baseline donor designation rate and Florida region as covariates. All DMV offices randomized ($n = 30$) were included in the analyses according to the original intent-to-treat design. Missing data (described later) were handled by using the zlast-observation-carried-forward imputation strategy. PASW Statistics 17.0 was used for all statistical analyses, and statistical significance was operationalized as P less than .05.

Results

Allocation and Attrition

All participating DMV offices were allocated to either the intervention or usual care group and participated in the baseline assessment (Figure 2). However, because of the economic downturn at both the national and state levels, several DMV offices throughout

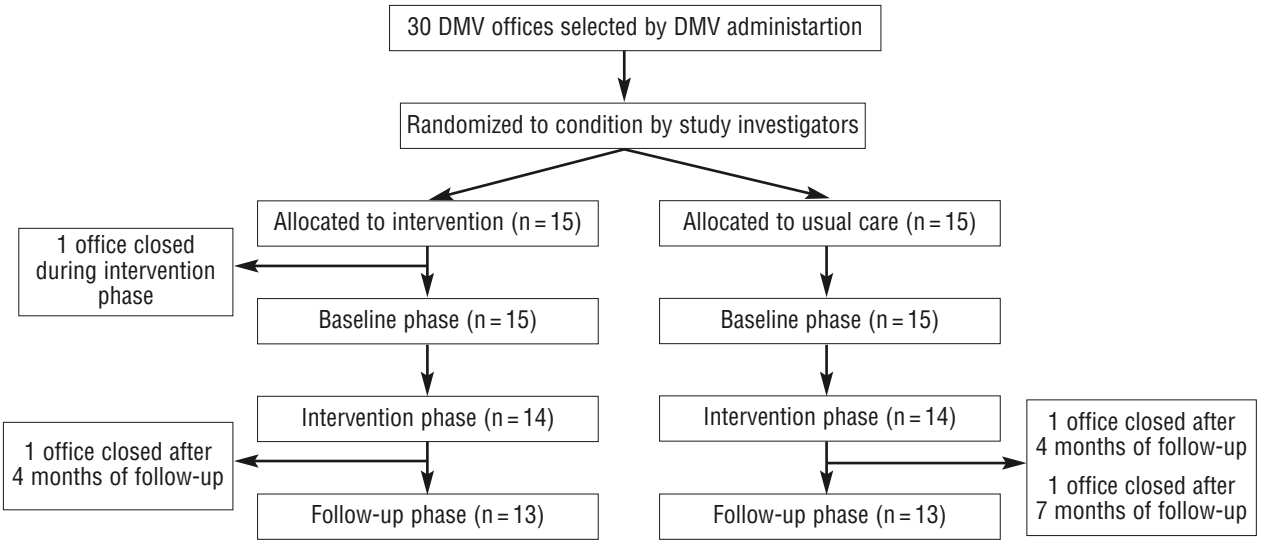

Figure 2 Overview of study design, assessment, and attrition.

Abbreviation: DMV, Department of Motor Vehicles.

Florida were either closed or consolidated as a cost-efficiency measure. One office allocated to the intervention group was closed during the intervention phase and another was closed 4 months into the follow-up phase. Two usual care offices were closed during the follow-up phase (one after 4 months and one after 7 months).

Baseline Donor Designation Rates

Analysis of baseline data showed considerable variability in donor designation rates among regions. Aggregate monthly donor designation rates during baseline for the intervention and usual care groups, broken down by region, are illustrated in Figure 3. Analysis of variance showed a significant main effect for region ($F = 10.4$, $P = .001$). Post-hoc analyses revealed that donor designation rates in the North region were significantly higher than those in the Central and South regions, and donor designation rates in the Central region were significant higher than those in the South region (all P's $< .05$). The group main effect ($F = 0.7$, $P = .40$) and region x group interaction effect ($F = 0.2$, $P = .85$) were not statistically significant. For comparison purposes, Figure 3 also includes the aggregate monthly donor designation rates for all other state DMV offices that were not participating in the study. Nonparticipating offices had slightly higher donor designation rates than participating offices in 2 state regions (Central, South).

Correlational analyses showed that lower donor designations rates were significantly associated with DMV service regions with a higher percentage of African Americans ($r = -0.41$, $P = .03$) and Hispanics ($r = -0.46$, $P = .01$), a lower percentage of college-educated residents ($r = 0.55$, $P = .02$), and lower per capita income ($r = 0.47$, $P = .01$).

Intervention Effectiveness

Figure 4 presents the aggregate monthly donor designation rates by assessment phase and group assignment. Controlling for baseline donor designation rate and region, analysis of covariance showed a significant group effect for donor designation rate during the intervention phase ($F = 5.7$, $P = .02$). The intervention group had a significantly higher aggregate monthly donor designation rate than the usual care group had. The group effect for follow-up phase donor designation rates did not reach statistical significance ($F = 1.3$, $P = .13$).

Discussion

This study is the most comprehensive, statewide effort to date to evaluate the effectiveness of a DMV-based intervention to increase donor designation rates. Four primary findings emerged from the study: (1) Baseline donor designation rates in Florida fall below the nationwide goal of 50%,[3] although there is considerable regional variation, (2) a comprehensive DMV-based intervention yielded moderate increases in donor designations, (3) increases in donor designation rates were not maintained in the months after the DMV-based intervention was withdrawn, and (4) the availability of organ donation educational materials alone (ie, usual care) did not significantly increase donor designation rates. These findings have important implications for future research and the implementation of DMV-based organ donation educational campaigns.

The central finding of our study is that a comprehensive DMV-based intervention focused on staff

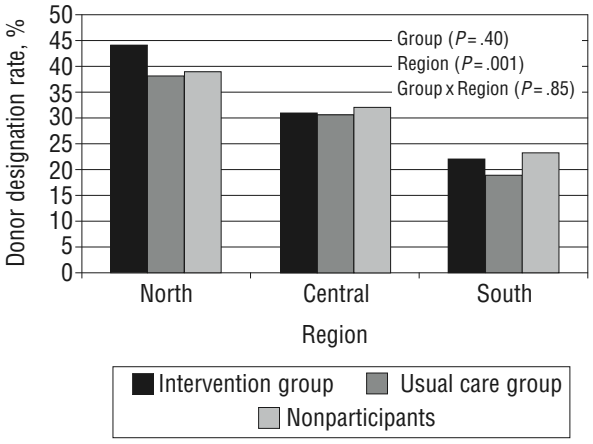

Figure 3 Baseline donor designation rates: intervention, usual care, and nonparticipating offices of the Department of Motor Vehicles by region.

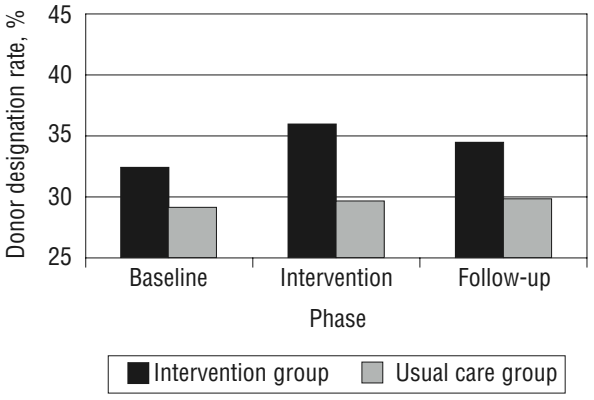

Figure 4 Donor designation rates by assigned group over time.

education and direct interaction with the public led to modest overall increases in donor designation rates. For the intervention group, there was a 10% increase in the aggregate monthly donor designation rate from the baseline to the intervention assessment phase, which compares favorably with the 1% increase observed for the usual care group. Harrison et al[7] similarly found that donor designation rates were significantly higher in counties where DMV clerks received organ donation education and communication training than in counties where clerks did not receive any such training. Active engagement with DMV staff and the public, while more personnel intensive and expensive, is essential to achieve moderate increases in donor designation rates. A passive approach of simply providing organ donation materials is important for maintenance of donor designation rates, but is not likely to increase overall rates of donor registration.

The baseline assessment during a 6-month period showed a relatively static donor designation rate of about 32% for the entire state of Florida, which falls short of the Donor Designation Collaborative target of registering 50% of all licensed drivers.[3] Particularly striking was the regional variability observed in the current study. Donor designation rates were substantially lower (20%) in the South region than in the North region (41%), with the Central region splitting the difference (31%). Florida is an exceptionally diverse state, ranging from the rural regions of the northwest Panhandle to the more densely populated and diverse southeastern areas of the state.

In our study, the participating DMV offices in the South region serviced a significantly higher percentage of minorities, low-income customers, and less-educated customers than DMV offices in the North region. These sociodemographic variables were all significantly associated with lower donor designation rates, which persisted through all assessment phases. Indeed, the 5 DMVs with the lowest donor designation rates, regardless of assigned group, serviced the highest percentage of minority customers of all DMV offices in the study. This may explain some of the interoffice variability seen within regions as well, as the lowest performing DMV office in each region had higher percentages of minorities and low-income customers. Overall, these findings are consistent with prior research[13-21] showing lower donor designation rates among African Americans and Hispanics, and they further amplify the need to develop cost-efficient, culturally sensitive, and effective educational campaigns to increase organ donation awareness, behavioral intention, and action in minority and low-income communities.[11,22,23] Wagstaff et al[24] found that the DMV office is the preferred location among African Americans for organ donor registration, and Harrison et al[9] provided compelling evidence that a multicomponent intervention at the DMV office can yield substantial increases in organ donor sign-ups among African Americans.

There are notable obstacles to delivering and evaluating effective organ donation campaigns in DMV offices. Organ donation registration processes vary from state to state and often vary within different municipalities in a state. Additionally, organ donation is not the primary mission of the DMV and, therefore, donor registration data coding, management, and sharing processes may not be well developed or conducive to evaluating quality improvement initiatives. There is a general lack of awareness and knowledge about organ donation and insufficient training of DMV clerks about how to communicate effectively with the public about organ donation.[7] Despite these barriers, DMV staff responded well to our education and training efforts. Most seemed genuinely interested in working with us to increase organ donation, especially after meeting transplant recipients who benefited directly from organ donation or family members who found

comfort in donating a deceased loved one's organs. OPOs interested in promoting DMV-based organ donation campaigns should consider designating someone to serve in a "DMV liaison" capacity to foster key relationships, establish a presence within DMV offices, provide staff training and booster sessions, and coordinate DMV-related volunteer efforts.

Relative strengths of this study include the use of a control group, the randomization of offices to group assignment, an intent-to-treat analysis, state and local DMV support for study participation, and implementation across disparate geographical regions in Florida. However, findings from this study should be considered within the context of several important methodological limitations. Although we were able to retrieve information about donor designations and drivers for the total customer base within each DMV office, we were not able to determine the number of customers who visited the DMV office in any given month who signed up to be organ donors. Therefore, we cannot say with certainty that the moderate increase in the percentage of donor designations we observed for DMV offices in the intervention group is attributable solely to intervention exposure. However, the finding that the percentage of total donor designations declined during the follow-up phase provides indirect evidence of the intervention's impact, that is, this decline may be attributable to fewer DMV customers registering as donors when the intervention was withdrawn.

Another limitation is that we did not assess the impact of DMV staff education and training on organ donation attitudes, beliefs, and communication effectiveness, as has been done previously.[7] It is possible that interoffice and regional differences observed in the data are due to differential staff knowledge and attitudes about donation and how effectively they communicate with the public about organ donation. Moreover, it is possible that the staff in-service training sessions that we provided did not have the intended effect, which may have limited percentage increases in donor designation rates.

Importantly, although we attempted to standardize the intervention, it is likely that some DMV offices in the intervention group received different "doses" of the intervention. We can confidently state that all intervention offices received the intended intervention components, but we did not monitor important process variables such as the amount of time on site, presence of recipients or donor family representatives, amount of time spent talking with DMV staff, product placements, and so forth.

Finally, the recession and corresponding economic challenges facing state governments and local municipalities necessitated the closure of 4 DMV offices that were participating in the study. Although we used a common imputation strategy to handle missing data from these offices, we did not anticipate attrition in designing the study, and attrition should be considered in future DMV-based studies.

Study limitations notwithstanding, our findings have several implications for future organ donation education campaigns and research. First, there is a need to identify "best practices" for the development, implementation, and evaluation of interventions targeting DMV offices.[7-10] An understanding of best practices would allow a more time-efficient and cost-effective approach to evaluation and would provide OPOs with the tools needed to integrate these research strategies into their community-based educational campaigns more quickly. Second, a 3-month intervention period was selected to ensure uptake of the intervention, but it is entirely possible that a shorter intervention period would yield similar findings.

Alternatively, the moderate increase in donor designation rates and the lack of a maintenance effect after withdrawal of the intervention may highlight the need for regular booster sessions with DMV staff and direct engagement with customers. Researchers must carefully evaluate strategies for sustainability. Finally, the need remains to determine whether increases in donor designations via DMV-based interventions lead directly to increased donation rates, something we were able to examine only indirectly. Presumably, if donor designations increase substantially, there should be a downstream increase in deceased donation, but the threshold needed to achieve these downstream effects is unknown.

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