

AN ABSTRACT OF THE THESIS OF

Christabelle W. Tsang for the degree of Master of Public Health in Public Health
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Title: Comparing the Bone Marrow Donor Registration Drive at Oregon State University
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Abstract Approved: _____
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More than 30,000 children and adults are diagnosed with life-threatening blood diseases such as leukemia, anemia and lymphomas in the U.S. every year. A transplant of stem cells, obtained from the bone marrow of a healthy donor, can be a cure for these diseases. The National Marrow Donor Program's registry comprises almost five million potential donors, however, many ethnic minorities are still underrepresented in comparison to their percentage in the overall U.S. population. Since patients are more likely to find a matching donor within their own ethnic community, recruitment efforts have been focusing on minority donors since a number of years.

A number of other studies are currently examining the psychosocial and physical effects of the donation experience, as well as identifying barriers against and reasons for donating bone marrow, using questionnaires and health models. However, none has yet looked at which recruitment settings work well for college campuses, to what extent the target group should be educated, and how the study results should be incorporated into the recruitment efforts to improve retention.

Potential donor education was therefore the most important focus of a Bone Marrow Donor Registration Drive organized by the author on the OSU campus in January. 150 potential donors registered at the OSU drive, one third of them from ethnic

minorities. This study examines if the drive's extensive education and outreach component had any impact on the number of newly recruited volunteer donors in comparison to OSU's peer institutions. Using the Chi square test, a proportion comparison was performed between the percentage of newly registered volunteer donors (both in total and broken down by ethnicity) among the eligible OSU student body, and the total eligible student body at each peer institution.

While the hypothesis that the extensive education and promotion activities increased the number of recruited donors could not be confirmed, targeting the minorities on campus was successful, since a significantly higher proportion of minority students registered at the BMDRD than the proportion of minority students registered at OSU.

Besides data on the impact of the promotional activities and the recruitment results, which can also be used for further research, the drive also yielded a protocol that can serve as a guideline for organizing future drives at OSU and other schools with similar resources.

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Comparing the Bone Marrow Donor Registration Drive
at Oregon State University with Peer Institutions

by

Christabelle W. Tsang

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COMPARING THE BONE MARROW DONOR REGISTRATION DRIVE AT OSU WITH PEER INSTITUTIONS

CHAPTER 1 INTRODUCTION

Statement of Purpose

The goal of this research was to evaluate the effectiveness of an intensive education and promotion program in the recruitment of ethnic minority donors for the National Marrow Donor Program[®] (NMDP) Registry. The research was conducted while I served as project coordinator of a Bone Marrow Donor Registration Drive (BMDRD)¹ sponsored by Student Health Services and the Office of Multicultural Affairs of Oregon State University (OSU) in early 2003.

The planning of the BMDRD started in July 2002. Promotion and education took place from November 2002 to January 2003, culminating in two days in mid-January when volunteers were tissue-typed and entered into the Registry by American Red Cross staff. The number of participants at each promotion and education activity was recorded. An evaluation form was given out to the volunteer donors who signed up to be marrow donors on January 13 and 14, 2003. The total number of recruited OSU volunteers and a breakdown of volunteers by ethnicity

¹ While planning the drive at Oregon State University, some confusion arose when people first heard the term "bone marrow drive". Many thought that marrow would be extracted at the recruitment drive. To clarify this, the term "bone marrow donor registration drive" was used in all materials as the official name of the OSU drive. Throughout this paper, "BMD" is equivalent to "bone marrow donor registration drive".

were obtained from the American Red Cross Pacific Northwest Marrow Donor Services. These data were then compared to the first BMDRDs held at OSU peer institutions. Finally, a protocol was developed as a guide for future OSU drives and also as a model for schools with similar resources as OSU.

Research Questions

1. Is there a significant difference between the number of recruited donors (categorized by ethnicity) at OSU and at its peer institutions?
2. Is there a significant difference between the percentage of recruited donors (categorized by ethnicity) and OSU enrollment (categorized by ethnicity)?

CHAPTER 2 LITERATURE REVIEW

Introduction

Annually, over 30,000 children and adults in the United States are diagnosed with life-threatening hematological diseases, such as leukemia, aplastic anemia, lymphoma, and immunodeficiency diseases, for which stem cell transplants² can be a cure. [1,2] Rigorous treatment using chemotherapy and/or radiation kills cancerous cells, but also kills the bone marrow, which contains stem cells. [3] Stem cells, however, are vital for the patient's body to produce new and healthy blood cells to build a new immune system. Therefore, a bone marrow or blood stem cell transplant must follow after the treatment, or the patient will almost certainly die. [1,2]

A patient in need of a stem cell transplant has the greatest chance of finding a matching donor within his or her family. However, only 30 percent of patients have a compatible donor available for transplant within their family, while the remaining 70 percent have to rely on unrelated volunteer donors. [3] Even though it is possible for a patient to receive bone marrow or stem cells from people of any

² The original source for stem cell transplants was bone marrow, but with medical advances, stem cells can now also be obtained from the bloodstream and the umbilical cord. In this paper, "stem cell transplant" refers to the marrow harvest and peripheral blood stem cell (PBSC) methods, but not to umbilical cord stem cell transplants. (For procedure details, see http://www.marlow.org/DONOR/steps_of_donation.html)

ethnicity, the patient has a better chance of finding a matching donor among people of the same ethnicity.

Because of the increasing number of patients who need to find unrelated donors, the National Marrow Donor Program[®] (NMDP) was founded in 1986 to develop a nation-wide registry of potential bone marrow donors. The NMDP is the international leader in facilitating unrelated marrow and blood stem cell transplantation. It is a non-profit organization with the mission “to facilitate successful transplants of hematopoietic cells from volunteer unrelated donors as life-saving therapy for patients of all racial and socioeconomic backgrounds.” [4] As of September 2002, there were 4,832,000 volunteer potential donors on the NMDP Registry, and the NMDP has facilitated 15,027 unrelated stem cell transplants, 2,269 (15.1%) of which have been for ethnic minority patients (see Figure 1). [5]

Inequality in Search for Matching Donors among Ethnic Minorities

Although the number of potential donors on the NMDP Registry has increased greatly in the last few years, the percentage of African American and Hispanic donors still is below these ethnicities' percentage within the U.S. population (see Figure 2). [6,7] Some people have suggested that due to the genetic differences among racial and ethnic groups, there is reason to believe that minority patients may not have the same chances as Caucasian patients to find matching

donors. [6,8] NMDP data showed that in the year 2000, Caucasian patients had an 88% chance of finding a matching donor, versus lower chances for African American (58%), Asian/Pacific Islander (75%), Hispanic/Latino (79%), and American Indian/Alaska Native patients (83%). [9] (see Figure 3)

Although the NMDP may not always identify new genetic types by recruiting more ethnic minorities, it still will increase the chances for people of all ethnicities who are searching for matching donors. In 1991, the NMDP began to focus its recruitment efforts with four groups of ethnic minorities that were and are still underrepresented on the Registry, and established the four recruitment initiatives “Uniting for Life” for African Americans, “Donors Can Save Lives” for Asian Americans and Pacific Islanders, “Giving Hope” for Hispanics, and “Keep the Circle Strong” for American Indians and Alaska Natives. [5] As indicated in Figure 3, the percentage of patients from these ethnicities who found a match have dramatically increased since 1988.

Basic Requirements and Procedures

People can join the NMDP Registry through recruitment efforts in various locations. The basic requirement for potential donors is being in general good health and 18 to 60 years old. Recruiters will first explain the marrow harvest³ and

³ Marrow harvest is a surgical procedure performed in a hospital operating room while the donor is under regional or general anesthesia. Part of the marrow is drawn out from the iliac crest of the pelvic bone with a sterile surgical needle and syringe. [10]

peripheral blood stem cell⁴ (PBSC) donation procedures to every volunteer donor. Then, the volunteer will fill out a health questionnaire, sign a consent form to have his or her tissue type listed on the Registry, and give a small blood sample to determine the tissue type. Once listed on the Registry, the potential donor's tissue type will be compared to thousands of patients around the world who need transplants. The record will remain on the Registry until the potential donor's 61st birthday. [10] At any given time, there is an average of 3,000 patients searching the NMDP Registry. [5]

Most registered donors are never asked to donate stem cells, but if a person is found to be a potential match for a patient, NMDP Donor Center staff will call them and ask for more blood samples for further testing. White blood cells and other body tissue cells are marked by antigens. [5] Human leukocyte antigens (HLA), especially HLA-A, HLA-B, and HLA-DR, are important to the success of stem cell transplants. Each person has three primary pairs of HLAs, and a matched donor must have the same HLAs as the patient. [6] If a potential donor is a true match, more information will be given to the potential donor regarding how the

⁴ PBSC is a new alternative to the marrow harvest, which has been performed by the NMDP since 1999. The donor will be given a daily injection of filgrastim, a stem cell growth factor, for four or five consecutive days. Filgrastim stimulates the release of stem cells from the marrow into the blood stream, so they can be collected through an apheresis procedure, which can be performed at a blood center or hospital. A sterile needle is placed in a vein in one arm, so blood passes through the apheresis machine that filters out the stem cells, and then returns to the body through a sterile needle in the other arm. [10]

marrow harvest and PBSC procedures work, and which one is preferred for the patient. The matched donor will undergo a physical examination, and there also will be a session where the donor meets with a physician and a NMDP representative to explain the donation procedures and possible side effects and risks of the donation. The matched donor will then decide whether or not to donate.

The most common side effects of the marrow harvest procedure include fatigue, pain at the collection site, pain when walking, sitting, and/or climbing stairs, back pain, sore throat, nausea, and light-headedness. Minor complications occur in 6-20% of cases, but are resolved within several days. [11] Major and life-threatening complications are estimated to occur at a frequency of 0.1-0.3%. [12] Most people recover within 2-4 weeks, and the marrow is replenished within 4-6 weeks. [10] For PBSC, the side effects are caused primarily by the administration of the stem cell growth factor filgrastim that stimulates the release of stem cells from marrow to the blood stream. Once the injections stop, the side effects gradually subside within 2-13 days. Major side effects of PBSC include bone pain, headache, myalgia, fatigue, insomnia, nausea, other flu-like symptoms, sweating, anorexia and chills. [13]

Cost and Possible Settings of BMDRDs

The monetary cost for HLA-typing varies, but in general, the fee for HLA-A, B, and DR molecular testing is US\$ 65 per person (it can range from US\$ 45 to

US\$ 100 depending on the tests that are being used). The potential donor usually pays this fee. [14] Because there is federal funding to cover ethnic minorities' HLA-typing, these individuals do not need to pay to become a donor. Occasionally, private funding and grants also are available to subsidize the cost for Caucasians' tissue typing. [9] If a matching donor is found, and he or she decides to donate, all of the medical and non-medical costs, including the donor's transportation, lodging, meals and incidental expenses, are covered by the patient, the patient's medical insurance, or the NMDP. However, any lost wages cannot be reimbursed if the donor chooses to take unpaid time off from work for the donation process (many employers provide paid time off for the donation, however). [15]

Currently, there are three major settings for a bone marrow drive (BMD): 1) A drive within a regular blood drive⁵, 2) a patient-focused drive⁶, and 3) a marrow-only drive⁷. When the NMDP was first established, almost all donors were recruited through blood drives [16], and interviews with donor center managers show that many marrow donor recruitments still are held at blood drives. Questions arise however when comparing the different levels of information and education that people receive during a blood drive setting, a patient-focused setting, and a marrow-focused setting. Some managers agree that education may not be as in-

⁵ Personnel who work at the blood drive ask blood donors if they would like to become potential marrow donors as well.

⁶ A drive that recruits volunteers by advertising a specific patient in need of a stem cell transplant.

⁷ A stand-alone drive focusing on the importance of having more volunteer marrow donors on the NMDP Registry.

depth at a blood drive as at a marrow-focused drive. Likewise, at a patient-focused drive, volunteers may get the impression of becoming a potential donor only to save that particular patient, rather than possibly becoming a donor for any patient who might come up as a match. [17,18]

BMDs are in some ways similar to blood drives, however, there are distinct differences that suggest these two kinds of drives should not be combined. First of all, a potential marrow donor only needs to register once in a lifetime, while a blood donor can donate blood as often as every eight weeks. [19] More importantly, the level of commitment is very different, as a potential marrow donor stays on the registry and may be called up until his or her 61st birthday, while a blood donor can decide to donate or not to donate from drive to drive. Understanding the commitment of becoming a marrow donor also influences the retention rate. If a matching donor agrees to donate, the required time and physical and psychological cost are substantially higher than blood donation. Some studies have shown that this commitment is a major barrier to registration for some people. [16,20]

Ongoing Efforts and Available Resources for Donor Recruitment

There are some organizations in the U.S. that are focusing on NMDP recruitment on college campuses, such as the Asian Pacific American Medical Student Association (APAMSA), the Mavin Foundation, and the Nu Alpha Kappa

fraternity (NAK). There currently are over 35 APAMSA chapters at various medical schools in the U.S., which also are involved with the Asian/Pacific American "Donors Can Save Lives" initiative. [21] The Mavin Foundation is focusing on recruiting volunteers from multiracial populations, and has initiated the MatchMaker Bone Marrow Project and the November Campus Marrow-thon (November 2002 being their second time holding this marrow-thon, with 31 participating universities). [22] NAK, focusing on donor recruitment from the Hispanic/Latino population, had 26 chapters on various campuses across the country in 2001. In October 2002, they implemented the national "Hermandad: Dando Esperanza Marrow and Blood Stem Cell Initiative" for the third time. [23]

Even though efforts are made to recruit particular ethnic minority groups for the Registry, there is no organization that focuses on recruiting all of the targeted minorities at the same time. The NMDP has developed many resources for recruiters to use and pass out to people, including an Education and Recruitment Guide for the National Marrow Donor Program (the "Guide"), four different ethnically-focused brochures, a general brochure, Q&A booklet, and gifts to remind people about becoming a donor. The Guide contains a lot of very useful information for people who are interested in organizing a drive, however, some of the suggestions might not be applicable or feasible for a college setting.

Problem Definition

One of the major difficulties for schools that have never held a drive before is the tremendous amount of time and energy required to organize such an event from scratch, and often, there is no exact protocol recorded for future replication of a drive. There also is little guidance as to how much education the recruiters should provide to volunteers prior to the drive in order to ensure that all potential donors fully understand what becoming a marrow donor entails. The current incentive model for donor recruitment centers is to impose a monetary reward or punishment on the centers depending on their annual number of recruited minority donors. This method can easily lead to organizations focusing more on the number of newly registered donors, than on thorough education and the need to increase awareness.

The lack of quality assurance regarding the depth of education and emphasis on the long-term commitment might be the key factor to increased attrition among registered donors. [24] Based on the NMDP Continuous Process Improvement (CPI) statistics of 1998, more than a quarter of the registered donors were unavailable to donate when called upon for further testing for a potential donation. Reasons for unavailability varied and included declination of further testing, being medically deferred, unreachable without current address, or temporarily unavailable. Retention is becoming a major focus, as higher retention will save patients' time and the NMDP's resources.

There are some studies in progress looking at psychosocial and physical effects and the perception of the donation experience among actual donors who have gone through the stem cell donation process. [16,20,25,26] A few studies looked at barriers against and reasons for donating bone marrow using questionnaires and health models. [8,27] No study, however, has looked at what kind of recruitment setting works well for college campuses, to what extent education should be presented to the target group, and how to incorporate the findings from those studies into the recruitment efforts to improve retention.

CHAPTER 3 METHODS

Setting of OSU's BMDRD

OSU's first Bone Marrow Donor Registration Drive was on January 13 and 14, 2003 at the Memorial Union (MU) Ballroom, as part of the Martin Luther King, Jr. Celebration. The Memorial Union is equivalent to a student union where a lot of people spend time in between classes and during lunchtime. This BMDRD was sponsored by the Student Health Services (SHS) and the Office of Multicultural Affairs (OMA). We held the drive on campus in order to raise awareness of the need for stem cell donors, and to provide the Corvallis community with an opportunity to become potential donors. The goal was to recruit 150 ethnic minority donors.

The funding for this project was limited, with all expenses paid by SHS and OMA. In addition, the American Red Cross provided free HLA-typing for all Caucasians who registered at the drive through "Touchdown for Life: The Collegiate Minority Marrow Donor Awareness and Recruitment Campaign"TM. For every two registered minority donors, the program would pay for one Caucasian donor.

Promotion, education and recruitment efforts started in November 2002 by approaching different offices and student organizations that have connections with at least one of the targeted ethnic minority groups (details about the approached

groups are presented in chapter 4). In order to not lose time over the three-week winter break, we started recruitment activities prior to the break by setting up information tables and visiting student organization meetings. Information about stem cell transplants was organized and shown on a display board for four and a half weeks prior to the drive at the Memorial Union concourse, where large numbers of the campus community passed, paused, or congregated. Flyers were distributed at various places on campus, and advertisements and a feature article ran in *The Barometer* (school newspaper), *OSU This Week* (faculty newsletter) and *Corvallis Gazette-Times* (local newspaper).

The week before the drive, an information booth was set up in the student lounge area of the Memorial Union for five days. Three educational presentations were scheduled during lunchtime, mid-afternoon, and late afternoon for interested parties at the MU Joyce Powell Goudy Leadership Center. Two presentations were also scheduled at the Asian/Pacific Cultural Center and at the Native American Longhouse the week before the drive. E-mails with detailed information about the drive and contact information were mailed to all student organizations and OSU faculty/staff in order to be forwarded to their member listservs (see Appendix D). The actual drive was finally held from 1 p.m. to 6 p.m. on January 13 and from 9 a.m. to 1 p.m. on January 14, 2003.

Potential donor education was the most important focus of this project, and I was interested in determining whether the extensive education and outreach

component of this BMDRD had any impact on the number of newly recruited volunteer donors by comparing this (OSU's first) BMDRD with its peer institutions' first BMDRDs⁸. Information about the BMDRDs and the recruited volunteers at each school were obtained from the respective local donor centers through the NMDP website. [29] Enrollment statistics of each university were obtained from the National Center for Education Statistics. [30] (see Table 1 to Table 6; note that the categorized enrollment only applies to undergraduates of each peer institution. Data were available only for five out of nine peer institutions.)

Statistical Analysis

Recruitment data were obtained from the American Red Cross Pacific Northwest Marrow Donor Services. All statistical analyses were conducted using JMP IN Version 4.0.4 (academic version) by SAS Institute Inc. Using the Chi square test, a comparison was performed between the percentage of newly registered potential donors (categorized by ethnicity) at the OSU drive, and the percentage of newly registered potential donors (categorized by ethnicity) at each peer institution's drive. The null hypothesis was that the extensive education and

⁸ Peer institutions of OSU are: Colorado State University, Iowa State University, Kansas State University, North Carolina State University, Oklahoma State University, University of Arizona, University of California-Davis, University of Oregon, Utah State University, and Washington State University. [28]

promotion program at OSU's drive did not have an effect on the number of recruited potential donors when compared to the recruited potential donors at peer institutions. The alternative hypothesis was that the OSU drive's extensive education and promotion program increased the number of recruited potential donors.

The second Chi square test was performed between the percentage of newly registered potential donors (categorized by ethnicity) at the OSU drive, and the percentage of enrolled students (categorized by ethnicity) at OSU. The null hypothesis was that there is no difference between the percentages by ethnicity. The alternative hypothesis is that there is a difference between the percentages by ethnicity.

Evaluation and Developing Protocol

An evaluation form was provided to each person who completed the registration process at the drive. Each person was given an informed consent form and an evaluation form approved by the Institutional Review Board at Oregon State University, and it was made clear that participation in this evaluation process was voluntary. A Spanish language version of the informed consent form and native Spanish speakers were also available at the drive. The purpose of giving out the evaluation form was to obtain feedback on where the potential donors had heard about the BMDRD, so we could draw conclusions on which medium or

combination of media had been most effective in promoting the BMDRD. The result of this evaluation could be useful for organizing future drives. In addition, a protocol was developed for replicating the BMDRD at OSU in the future, and hopefully at other universities with similar facilities and resources.

Focus of the Education and Promotion Program

The extensive information and education program at the OSU drive consisted of staffed information booths set up in the MU student lounge during the week before the drive with two videos playing continuously at the booth. The two videos were "The Missing Piece" produced by the National Marrow Donor Program in 1999, and "SHOW Program[®]" provided by the American Red Cross Marrow Donor Services. In addition, there were a number of hour-long education presentations in the MU and at various cultural centers. The following key points were addressed at all booths and sessions, using print and audiovisual materials:

1. Becoming a marrow donor is a long-term commitment.
2. Even though our recruitment efforts for this drive are focused on minorities, Caucasians still are needed on the Registry and are welcome to register, too.
3. A potential donor may be asked to donate bone marrow or stem cells to people of any ethnicity/race.

4. Explain different donation processes, their advantages and disadvantages, risks, pain, and time/cost requirement, their importance for different patients.
5. Personal stories provided by the NMDP.
6. In order for the NMDP to locate the potential donor when a match was found, the volunteer needs to keep his or her address updated through the NMDP or the local donor center.
7. Becoming a marrow donor is not for everyone, but it is important that people know about it and consider this opportunity to offer the second chance of life to someone in need.

Recruiting Student Volunteers

Holding the first bone marrow drive requires a lot of organization, and especially volunteers to help with promotion and education as well as staffing stations at the actual drive. Some student groups were approached in the beginning of the 2002 Fall quarter to recruit volunteer educators. Two different kinds of helpers were distinguished:

- 1) Volunteers: They had general knowledge about bone marrow donation, as well as the dates and times for information sessions and the actual drive. They shared the information with classmates and friends, mainly to spread the word about when the drive was and how people could get more information about

becoming a marrow donor. They also helped with staffing different stations at the drive.

2) Educators: They had in-depth knowledge about the complete bone marrow donation procedures. A one-hour training session was provided for them; in addition, they were given a reading package and offered oral practice sessions. They were the people who staffed the information booths and gave detailed information to groups and individuals.

Groups approached for volunteers included the Peer Health Advocates (PHA), the Student Health Advisory Committee (SHAC), the International Cultural Service Program (ICSP), Halsell Hall (a dormitory that requires residents to volunteer in service activities), the International Students of OSU (ISOSU), Cultural/Resource Centers and Greek Life. Six educators were recruited through SHAC and ISOSU, and the majority of volunteers staffing stations at the drive came from ICSP and PHA. Approximately 35 volunteers were present at the 9-hour BMDRD to support the American Red Cross staff performing the registration procedures.

CHAPTER FOUR RESULTS

Data for the Peer Institutions and OSU

Eight local donor centers were contacted for BMD records of the nine peer institutions of OSU. Of these centers, useful data were obtained for five universities: University of Arizona (UA), Colorado State University (CSU), Oklahoma State University (OKSU), University of Oregon (UO), and Washington State University (WSU). (See Table 7 to Table 11) [18,31-36]

Prior to 1997, potential donors could register on the NMDP Registry without paying any tissue-typing cost. In 1997, the cost to be a marrow donor changed to the current model, where subsidies for HLA-typing are available only for ethnic minority and multiracial donors, but not for Caucasians. Therefore, only the first available drive data after 1997 were used for statistical analyses and comparison to the OSU drive. For Iowa State University and Utah State University, there were no data indicating a previous drive. [37,38] For Kansas State University, only data of 1995 were obtained, which were too old to be used in the analysis. [38] There were no responses from the centers responsible for University of California – Davis and North Carolina State University. Data for OSU were obtained after the BMDRD from the American Red Cross. (See Table 12)

Research Question One

A Chi-square test was performed to compare the percentage of newly registered potential donors (categorized by ethnicity) at the OSU drive and the percentage of newly registered potential donors (categorized by ethnicity) at each peer institution's drive. The result cannot be used because 20% of cells have an expected count less than 5. (see Figure 4) Figure 8 shows a graph of OSU's and peer institutions' recruitment data.

Since there was not enough data in each cell for a Chi-square analysis, all ethnic minorities were combined into a "total minority donors" group for each drive and a "total minority students" groups for each school. A Chi-square analysis was then performed to compare the total minority and Caucasian students at OSU to the recruited total minority and Caucasian donors at the peer institutions. A statistically significant result was found ($\text{prob} < .0001$), with a weak strength of relationship ($R\text{-square} = 0.0670$). The result rejects the null hypothesis that there is no difference in recruited numbers between OSU and peer institutions. However, it does not support the hypothesis that the extensive education and promotion activities increased the recruited potential donors. The University of Arizona and University of Oregon drives were the main factors of the significance, however, they have a higher number of recruited total minority donors than OSU's drive. (See Figure 5)

Research Question Two

A Chi-Square test was performed to compare the percentages of each ethnic minority and of the total minority student body between the OSU enrollment figures and OSU's BMDRD recruitment figures. The result cannot be used because 20% of cells have an expected count less than 5. (See Figure 6) The graph in Figure 9 shows the difference of each ethnic minority and the total minority student body between OSU enrollment and OSU BMDRD recruitment.

The percentages of African Americans and American Indians who registered to be a marrow donor are very close to the percentages of their respective ethnic groups among the total OSU student body. The percentage of Caucasians registered at the drive was lower than the percentage of Caucasians enrolled at OSU. However, Asian/Pacific Islanders and Hispanics have higher recruitment percentages at the drive than enrollment percentages in the total OSU student body.

For additional analysis, all recruited minority donors at OSU were combined to form a "total recruited minority donors" group and all minority students enrolled at OSU was also combined to form a "total enrolled minority students" group. A Chi-square analysis was performed between the recruited donors at OSU (categorized by total minority and Caucasian donors) to the enrolled students at OSU (categorized by total minority and Caucasian students). The result was statistically significant ($\text{prob} < 0.0008$), with a weak strength of relationship (R-

square = 0.0514). (See Figure 7) This shows that a significantly higher proportion of minorities registered at the BMDRD than present in the total OSU student body.

Data on Recruitment Activities Targeting Student Organizations and Offices

Education presentations on marrow donation were presented at the PHA staff meeting and the SHAC meeting at the beginning of the fall term. This way, not only the volunteers and educators we recruited received the information, but also some other members of those groups, who helped spread the information by word of mouth. Through the SHAC meeting, I was able to connect with the Physical Activity Courses (PAC) for faculty and staff. Later I had a meeting with the PAC staff, and they shared the information with their members through the listserv.

The Greek Life Director was contacted for information regarding the best method to approach the fraternity and sorority members with diverse backgrounds. Some Greek leaders, who were responsible for diversity development and education, were contacted for assistance, but none responded. There are four ethnically-focused student organizations within the Greek Life at OSU, including Alpha Kappa Alpha (African American Sorority), Gamma Alpha Omega (Latina Sorority), Kappa Alpha Psi (African American Fraternity), and Omega Delta Phi (Latino Fraternity). Emails were sent to all groups, but none responded. Presentations were also given at the Panhellenic and the Interfraternity Council

prior to the winter break, along with a follow-up email sent to the groups at the beginning of spring quarter. Greek house visits were made to two sororities at their Monday night dinner prior to the drive.

To obtain information on how to promote the BMDRD within the ethnic communities on campus, the Minority Education Offices (MEO) were contacted. The MEO consist of the Asian Pacific American Education, Casa Educacional, Indian Education, and Ujima Education offices. Their coordinators have connections to all OSU students who identify themselves as a member of one of the ethnic minority groups in their admission data. Meetings were arranged with the coordinators of all programs, and promotional materials and brochures were presented to them. The week before the drive, the MEO sent out emails to all students on their listservs.

The MEO helped to identify some student organizations to contact. OSU Student Involvement also sent out an email to all student organization leaders to inform them about the BMDRD. After the student leaders forwarded the email to their members, some groups requested individual presentations at their meetings. The student organizations contacted were the Asian/Pacific American Student Union (APASU), the Black Student Union (BSU), Black Men Circle, Black Women Circle, Hispanic Student Union (HSU), Hui-O-Hawaii, International Students of OSU (ISOSU), Isang Bansang Pilipino (IBP; Filipino Student Association), Kalmekak Community Outreach Program, and Movimiento

Estudiantil Chicanos de Aztlan (MEChA). Out of those student organizations, presentations were given at APASU, HSU, Hui-O-Hawaii, ISOSU, and IBP meetings. Before Thanksgiving, some student leaders organized the Native Night and Kwanzaa Pre-Thanksgiving Dinner – unfortunately, however, they did not respond when asked if a booth with brochures could be set up at the event.

The coordinator of the Cultural/Resource Centers was also contacted, since the coordinator supervises the staff operating of the Asian Cultural Center⁹ (ACC), Centro Cultural Cesar Chavez (CCCC), Lonnie B. Harris Black Cultural Center (BCC), and Native American Longhouse (NAL). Many individuals and diverse student organizations use those centers for leisure activities and meetings. Presentations were given at both the all-center meeting with the internal and external coordinators, and also at the individual centers' staff meeting at the BCC. All centers were given recruitment brochures and posters for their respective ethnic groups to distribute to their visitors. Emails also were sent out to their listservs to encourage participation.

Besides establishing connections with student groups, contacts were made with OSU staff and faculty. Meetings were arranged with the Vice Provost for Student Affairs office, and they agreed to send out a detailed email to all OSU faculty and staff. The Associate Athletic Director for the Intercollegiate Athletics was also contacted for support. However, we did not follow-up to see which action

⁹ The Asian Cultural Center was renamed to Asian Pacific Cultural Center in March 2003 in order to be more inclusive of the Pacific Islanders that are active in the Center.

was taken to promote the BMDRD among the athletes. The Dean of the College of Health and Human Sciences was contacted for support as well, and the Director of OMA also sent an email to the listserv for the Association of Faculty for the Advancement of People of Color (AFAPC) and Student of Color Recruitment and Retention Committee (SOCRRC). The Educational Opportunities Program also forwarded the email message to their students, which mostly are students of color.

Summary of all contacted groups

Table 13 shows a summary of the meetings attended and the audience reached on those occasions, as well as of listservs that were used to send out announcements of the BMDRD.

Data on Other Recruitment Activities on Campus

Other recruitment activities besides contacting student organizations and offices included setting up an information booth in the MU Student Lounge, putting detailed information about marrow donation on one of the MU display boards, hanging a large poster at the entrance of the MU, and offering education presentations to people. Table 14 shows a summary of the number of people who visited the information booths or attended one of the presentations.

Results of the Evaluation

Out of the 150 registered donors, 129 (86%) completed the evaluation sheet (see Appendix A). Results of the evaluation were tallied and are summarized below. Learning about the BMDRD from friends was the most common response, following seeing the article and advertisement in *The Barometer*, receiving an email through a listserv, getting information from the MU booth, and seeing the information displayed on the MU display board (see Table 15).

According to the information gained from the evaluation forms, the majority of new donors were OSU students, followed by OSU faculty/staff and then Corvallis community members. About half of the people knew about bone marrow donation prior to the OSU drive, with the rest not knowing anything before the drive. Seventy-five percent of the new registered donors knew how to update their current address (see Table 16).

Seventy-one out of the 129 respondents (55.0%) indicated that they learned about the BMD through one medium. Among them, the majority of them heard about it from their friends, *The Barometer*, listservs, and information booths. The pattern assimilates the overall evaluation result. Thirty of the respondents (23.3%) identified two media, while 16 people (12.4%) identified three media where they heard about the event. About nine percent of respondents indicated that they learned about the BMDRD from four or more sources, but the majority of them are likely to be student leaders or volunteers at the BMDRD because of the sources

they identified (such as combinations of listservs and student group meetings). (see Table 17)

CHAPTER FIVE PROTOCOL

One of the goals of this project was to create a protocol for future OSU BMDRDs that hopefully can also be useful for other universities with similar resources. Because we are expecting the Second OSU Bone Marrow Donor Registration Drive to be during the January 2004 Martin Luther King, Jr. Celebration, the following protocol describes the timeline from the end of the summer 2003 to the beginning of January 2004: (see Table 18)

Spring Quarter (April-June)

In the spring quarter, a new steering committee should be formed to start organizing the BMDRD for the winter term of the following academic year. Spring quarter usually works better to recruit new organizers because the majority of the student organizations have elections during spring term. It is also important to ask the people who have volunteered at the drive if they are willing to participate in the planning process for next year. It is important to let the people joining the committee identify themselves as educators and/or event organizers. According to the Guide, it is best to set up committees, however this does not always work out due to the small number of organizers.

It also is important to set a date for next year's drive, and arrangements need to be made with the American Red Cross Marrow Donor Services (who will

perform the actual tissue typing and potential donor registration), as well as the Memorial Union (to reserve the Ballroom, which can be booked one year in advance). It is important to hold the drive at the Ballroom because of its central location on campus, as well as its professional and clean appearance. Since the regular blood drives are also held in the Ballroom, this will make the location easier to remember and associate with donation events.

The current committee should set up a meeting with the new committee. That meeting should not solely consist of handing over a folder filled with information, but the organizers should go over the preparation process step-by-step. Often, the current committee might not be on campus to help for the following year, however electronic mailing can still facilitate effective communication in this case.

The new committee then needs to set goals for the drive, e.g. on potential donors to target or if the committee should expand the recruitment activities to the community or neighboring communities. The scale of the promotional activities depends on the number of people participating in the committee. It is important to go through the timeline provided above with the committee members and make modifications where the group sees fit.

A major planning component is to target and plan recruitment activities around orientation week. There rarely is a chance when so many students gather, especially new students who are very likely not marrow donors. Extensive

education may not be feasible at the orientation, however, it is important to raise awareness that a BMDRD will happening on campus in a few months.

Summer (July - September)

Members of the steering committee should be given the Guide provided by the NMPD. All members should spend time to obtain at least basic knowledge about stem cell transplants. Educators should read more in-depth information about stem cell transplants and ask questions often. The National Marrow Donor Program has excellent personnel and researchers available to answer any questions regarding the scientific and medical aspects of stem cell transplants. The American Red Cross Marrow Donor Services is based in Portland, and it poses a distance barrier for some people. However, they have been very helpful in providing any assistance, especially regarding recruitment.

During the summer vacation, a lot of students are not on campus, so only limited preparation is possible at this time. It is important to get in touch with the American Red Cross Marrow Donor Services to receive promotional material in preparation for the fall term recruitment. Recruitment material is needed for orientation, student organizations and cultural centers, and offices working with ethnic minorities. It is important to obtain sufficient amounts of material early, so that recruitment activities will not be limited by a lack of material to hand out.

Often organizations are so busy that you can only visit them once and give out all information.

A list of targeted groups to recruit potential donors needs to be finalized before or immediately after school resumes. Though the list will likely change throughout the term, it is important to have a clear expectation on the number of groups the committee will be contacting. Sometimes groups will refer you to other related groups. For some offices on campus, the beginning of the term is slower than later times during the term. Those offices might be more receptive at the beginning. With some student organizations, it might take longer for the organizers to get the contacts and for the organizations to get going; therefore, it is important to plan early.

Fall Quarter (October)

At the beginning of the quarter, display boards should be reserved, since it is important to reserve them early. It will be ideal to have a display board up in November because it is the National Marrow Awareness Month, but if the situation does not allow that, it is still important to start the display in December. Detailed information about the need for stem cell transplants, current transplant statistics, procedures, and place and time of various recruitment activities should be displayed on the board. Information on recruitment activities include the places and times of the information booth, education presentations, and the actual BMDRD

(tissue-typing and registration event). Contact information is also important, both in telephone and electronic form.

The steering committee needs to decide on the dates for information booths and education presentations. The most suitable times for information booths are two days at the end of November and one session each day starting a week before the actual drive. Information booths should be staffed between two to three hours, and will be most effective if held during lunchtime. Depending on the number of educators and the time available, there can be more than one educational presentation. If arrangements can be made with the American Red Cross to direct the presentations, organizers can focus more on advertising the presentations and asking students to participate. This will reduce the pressure on educators to know every aspect of stem cell transplants. The education presentations should take place the week before the drive, at a convenient time (usually early evening). It is recommendable to recruit more educators, if needed. Even if they do not present at the main presentations, there will be many presentations for individual groups throughout the term. It will reduce people's workload if at least five educators are available.

By the end of October, contacts for all recognized student organizations should be available. This will be a suitable time to contact them and schedule a presentation. Often, it will work best to ask for 10-15 minutes at the beginning of their regular meeting time.

A press release and a flyer also need to be developed, so that they will be ready to be distributed in November.

November

By November, meetings should have been set up with a number of organizations, as this will be the major month for presentations. Key points of presentations will usually be general information on marrow donation, things to consider before becoming a marrow donor, and how to register. Brochures and a reminder flyer are given to audience, and if time allows, videos can be shown. An important detail is to ask people to bring two addresses other than their current address to the drive when they will register (we did not mention that in advance this time, so some people did not have the addresses with them and had to either get them from home or decide not to donate). Since there is often only one opportunity for the educator to interact and communicate with the group, it is important to give the audience precise and adequate information, as well as a contact person for further questions.

November is also the National Marrow Awareness Month. It will be a good opportunity to promote marrow donation and the drive in January. This can also be a good way to attract more volunteers for the drive. The end of November will be a good time to send the press release to different news and communications, and possibly doing some follow-ups and interviews in December when the quarter

starts to go slower. There also are campus resources to write up story and distribute widely to print and broadcast media. It is also important to start asking groups for volunteers, especially community service groups. All students should have their winter schedule by the end of November, so it will be easier to obtain commitment.

December

In December, posters need to be put up around campus and in town, especially in places where a lot of ethnic minority students spend time, for example, restaurants featuring ethnic cuisines, cultural centers, cafeterias, library, and offices that serve minority students.

Winter Quarter (January)

A staffed information booth should be set up a week before the drive with the educational videos continuously playing. The American Red Cross Marrow Donor Services have a very noticeable promotional banner available that can be used to draw attention to the booth. A large-scale education presentation also should be held the week before the drive. It is important to ask the school newspaper to do interview and to write an article about the drive because it will increase readers' curiosity and motivate them to visit the information booth.

Because the majority of student group presentations took place in November, it is important to ask the groups to send out an electronic reminder about the upcoming BMDRD.

Finally, there will be the actual drive. While the critical tasks (tissue typing and potential donor registration) are being performed by staff of the American Red Cross Marrow Donor Services, they will need assistance from student volunteers. The organizers need to coordinate in advance which volunteers will serve at which stations at which times. About 30 volunteers are needed for a two-day drive targeting 200 newly registered donors. If sufficient numbers of volunteers are available at and before the drive, some of them can distribute flyers at the entrance of the Memorial Union or the library.

February

After the BMDRD, it is important to have an evaluation meeting with all members of the committee and other individuals who were involved with or would like to become involved with the BMDRD. It should be discussed whether the steps taken at the current drive were efficient or not, and how to proceed for the next BMDRD.

Remarks

When using this protocol as a guide for other schools, modifications will likely be necessary in order to tailor it to their individual situation and surroundings. More good ideas can be found in Section 3 of the "Education Guide: For Community Education & Recruitment" published by the NMDP. When organizing a drive, it is highly recommended to keep a good record of all meetings and all contacts made with people and groups. This information will be valuable when planning future bone marrow drives.

CHAPTER SIX DISCUSSION

Observations and Limitations

The result of the OSU drive was satisfactory. Despite the fact that we did not reach the target of recruiting 150 *ethnic minority* donors in this drive, a *total* of 150 newly recruited donors were added to the NMDP Registry, including 52 ethnic minority donors. Statistics have shown that the ratio of minority donors to Caucasian donors registered at the BMDRD and the ratio of minority students to Caucasian students enrolled at OSU were significantly different. The proportion of minority donors was larger than the proportion of minority students, especially among the Asian population. Similar results were found in all bone marrow donor registration drives at peer institutions. Moreover, the minority donor proportions at the drives at the University of Arizona (UA) and the University of Oregon (UO) were larger than the Caucasian donor proportions. However, it is important to note that the drive at UA took place within a blood drive, and that the drive at UO was part of the annual Asian Fair. The differences in the settings of the drives could contribute to the differences in the number of registered minority donors.

It is important to note that the analyses were preliminary, and the data we could obtain were limited. Furthermore, there is no uniform system of naming drives, which made the process of finding drives held at specific schools more difficult – for example, if a drive took place off-campus, but was organized by a

student group, the name of the drive might solely reflect the location of the drive, rather than including the school involved in the effort. I was able to get some information on the settings of the drives for some peer institutions, however there is no record on how the drive was advertised on campus. The data collection process was very time consuming, and there was no single database that recorded all the recruitment data.

By organizing the first BMDRD on the OSU campus, we provided an opportunity for people to register as a donor. I received a lot of oral feedback regarding how much people appreciated OSU organizing this BMDRD and that they have been wanting to register for a long time, but never had a chance.

The Touchdown for Life program has made a very generous contribution to this drive and thus relieved us from the concern of the lack of funding for any Caucasian HLA-typing. A lot of people were not enthusiastic about the whole event because of the lack of subsidies available. However, by financing the first 50 Caucasians' HLA-typing through the Touchdown for Life program, we could satisfy some people who felt that there was a sense of inequality in this project.

The number of volunteers was sufficient to deal with the scale of this drive. Unfortunately, the educators signed up at a later stage, and some of them did not feel comfortable enough to give presentations to other groups. Therefore, I performed all the presentations for this drive. One of the resulting advantages was that all information given out was standardized, using a uniform outline and

distributing the same materials. Another interesting experience drawn from the drive was the effectiveness of the feature article in the school newspaper. After the article was published, the number of people who stopped by the information booth was much higher. Some people have also contacted SHS or myself to be a volunteer, all of them having some personal experiences with stem cell transplants.

Recommendations

Even though we changed the name “Bone Marrow Drive” to “Bone Marrow Donor Registration Drive”, a lot of people still misinterpreted the name and thought that marrow would be drawn on the day of the drive. One of the suggestions made by many people who completed the drive was to point out that only a little amount of blood would initially be taken by the Red Cross. The Pacific Northwest American Red Cross Marrow Donor Services uses a newer method of collecting a blood sample, in which the donor only needs to apply drops of blood to five small circles on a piece of special paper. Emphasizing this method on the future flyer could show people that they will not be giving bone marrow at the drive, but just register.

From the evaluation forms, we found that learning about the drive from a friend was one of the major channels of promotion. Thus, it should be emphasized at all promotional activities to ask people to share the information with their

friends. It is also important to find advocates within the ethnic minority populations to reach the others.

One major component of effective promotion that should not be overlooked is to have a good distribution of educators and volunteers across all targeted ethnic minority populations. I noted that since I am an Asian, it was easier for me to contact Asian groups, and the Asian groups also responded faster than the others when I tried to set up a meetings. You obviously need members of a particular community to successfully introduce yourself into that community, be able to gain their trust and communicate with them. If I had had more advocates from other minority groups, a difference in the total number of recruitments might have been possible, even though Asians form the largest minority group at OSU.

As a last recommendation, all recruitment materials need to be organized and available to people at convenient places and times. If the drive continues to be included in the Martin Luther King, Jr. Celebration, the timing of the BMDRD organization will be crucial, so the three- to four-week winter break just before the drive won't have a negative effect on the momentum and effectiveness of the promotion.

Outlook and Opportunities for Future Research

At a debriefing meeting with the director of the Office of Multicultural Affairs and the Health Services Relations Specialist of Student Health Services, it

was decided to continue the Bone Marrow Donor Registration Drive at OSU next year during Martin Luther King, Jr. Celebration. The Student Health Advisory Committee has been contacted to be in charge of the steering committee.

Associated with this and further drives, more research opportunities can be addressed, for example comparing recruitment numbers between the first and the second drive while keeping all aspects of the promotional activities constant. More studies are also needed to understand efficient ways to recruit and communicate young and healthy individuals on a university campus (both ethnic minorities and Caucasians), who are typically less aware of the illnesses that require stem cell donation as a cure.

Conclusion

In my communications with students, school administrators and faculty/staff, I found that there is a lot of misunderstanding about stem cell transplants. Many people have heard about it, but they do not know why there is a need for a transplants, a need for more registered donors, and especially the racial disparity within the registry. The first reaction from the majority of people was feeling scared and disgusted by the thought of having a big needle puncturing their body. It is crucial to continue the education efforts to promote this action of good will. By advertising the simple procedure of becoming a marrow donor, more people may overcome their fear. At the same time, we should not lose sight of the

main purpose of these efforts, which is to increase the awareness of stem cell transplants, and not solely to meet a quota of newly registered donors.

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APPENDICES

APPENDIX A

Sample of Evaluation

Bone Marrow Donor Registration Drive Evaluation

Where did you hear about the drive?
(Please check all that apply)

- ☐ Announcement in class
- ☐ Barometer
- ☐ Friends
- ☐ Faculty/Staff Fitness Program
- ☐ Gazette-Times
- ☐ Information booths at MU Student Lounge
- ☐ Listserv, please specify: _____
- ☐ OSU This Week
- ☐ MU display board
- ☐ MU concourse
- ☐ Physical Activity Course Program

Education presentations:

- ☐ MU Leadership Room, Time: _____
- ☐ Asian Cultural Center
- ☐ Native American Longhouse

Student Groups:

- ☐ Hispanic Student Union
- ☐ Student Health Advisory Committee
- ☐ Asian Pacific American Student Union
- ☐ Isang Bansang Pilipino
- ☐ Others: _____

Cultural Centers:

- ☐ Asian Cultural Center
- ☐ Centro Cultural Cesar Chavez
- ☐ Lonnie B. Harris Black Cultural Center
- ☐ Native American Longhouse

Minority Education Offices:

- ☐ APA Education
- ☐ Casa Educacional
- ☐ Indian Education
- ☐ Ujima Education

Greek Life:

- ☐ Interfraternity Council
- ☐ Panhellenic
- ☐ Individual house meetings

- ☐ Other, please specify: _____

- ☐ If you did not learn about the drive from any of the above, what made you decide to participate? (Please use the back for additional space)

Are you:

- ☐ OSU student
- ☐ OSU Faculty/Staff
- ☐ Community member of Corvallis area

Did you know anything about marrow donation prior to this recruitment effort at OSU?

- ☐ YES
- ☐ NO

Do you know how to keep your address updated with the National Marrow Donor Program (NMDP)?

- ☐ YES

APPENDIX B

Figures

Figure 1. NMDP Facilitated Transplants Distribution by Race (as of Sept. 2002)

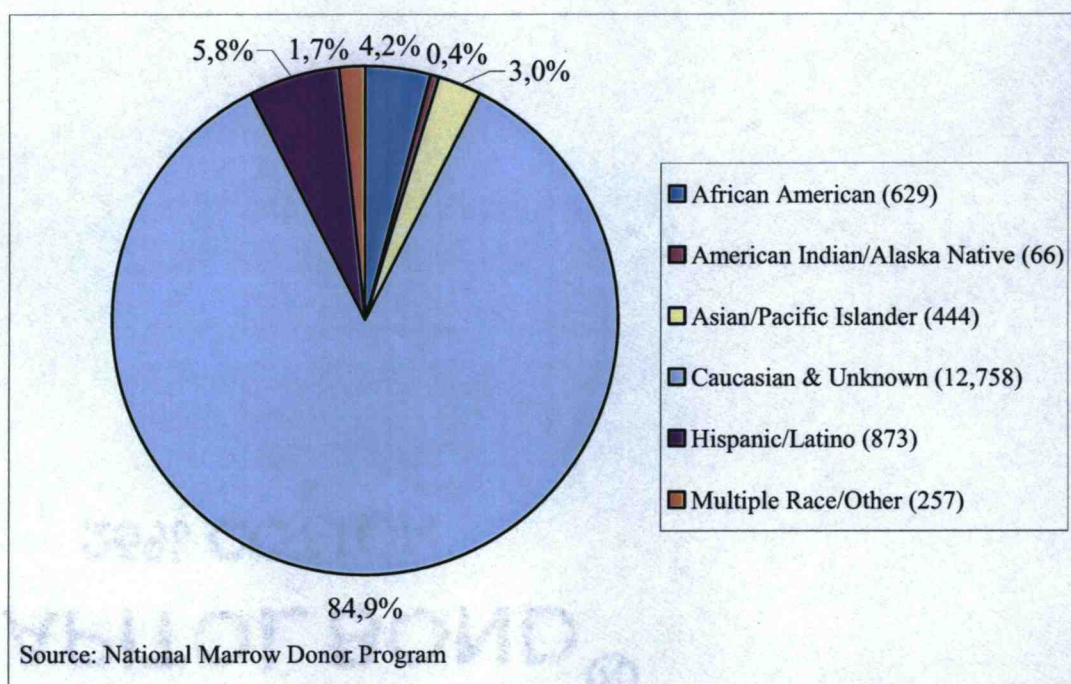


Figure 2. NMDP Registry Distribution and U.S. Population Distribution

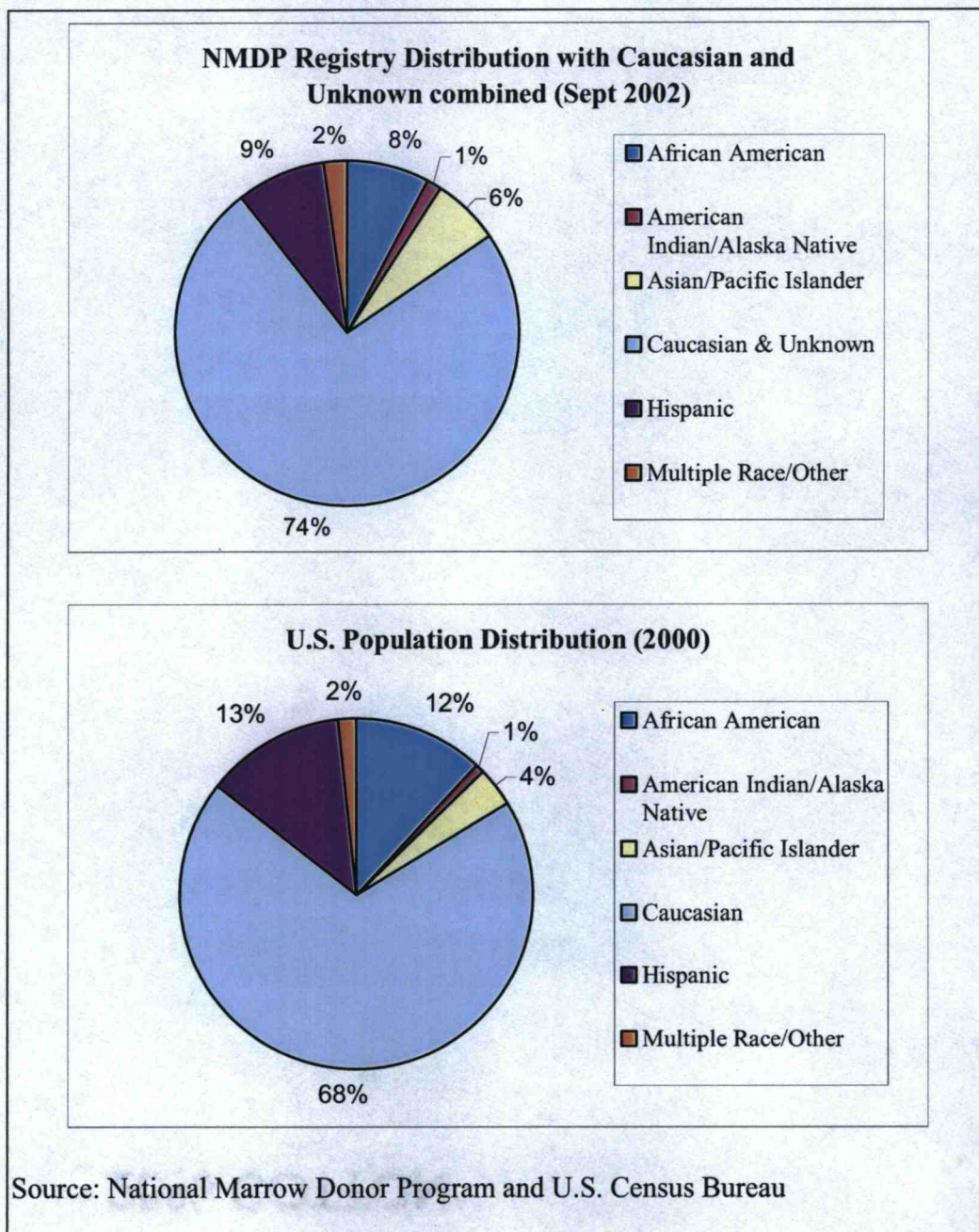


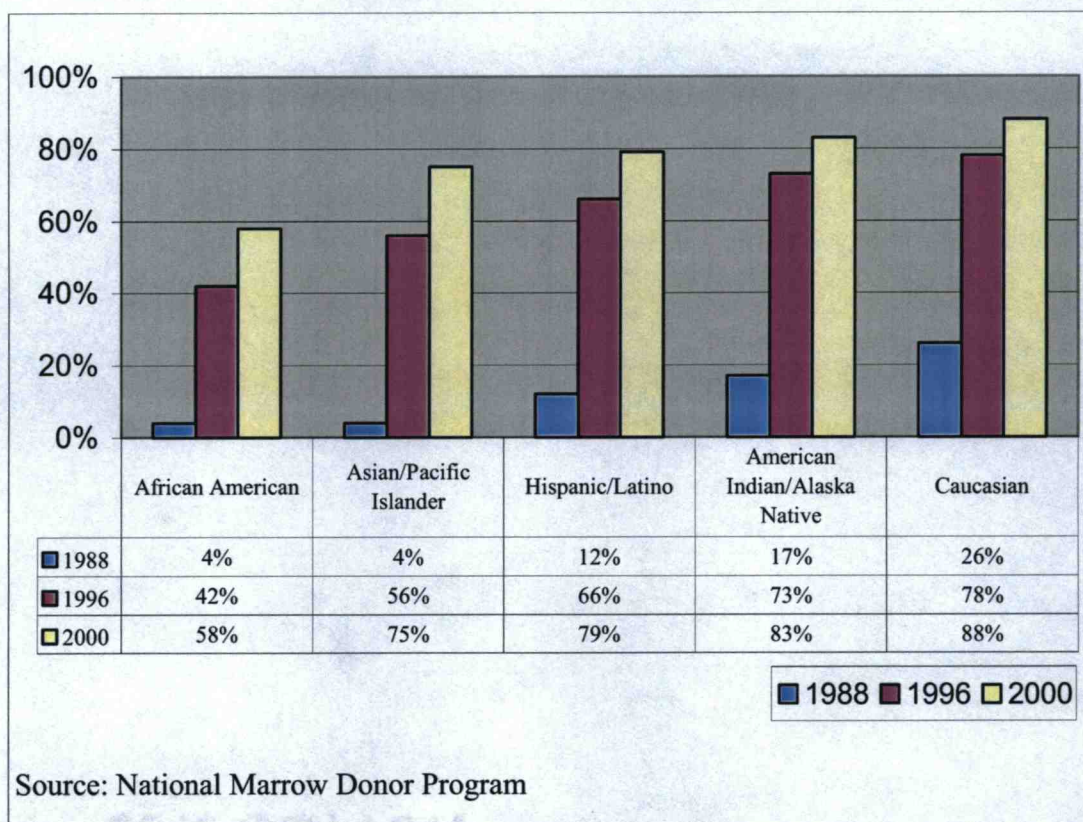
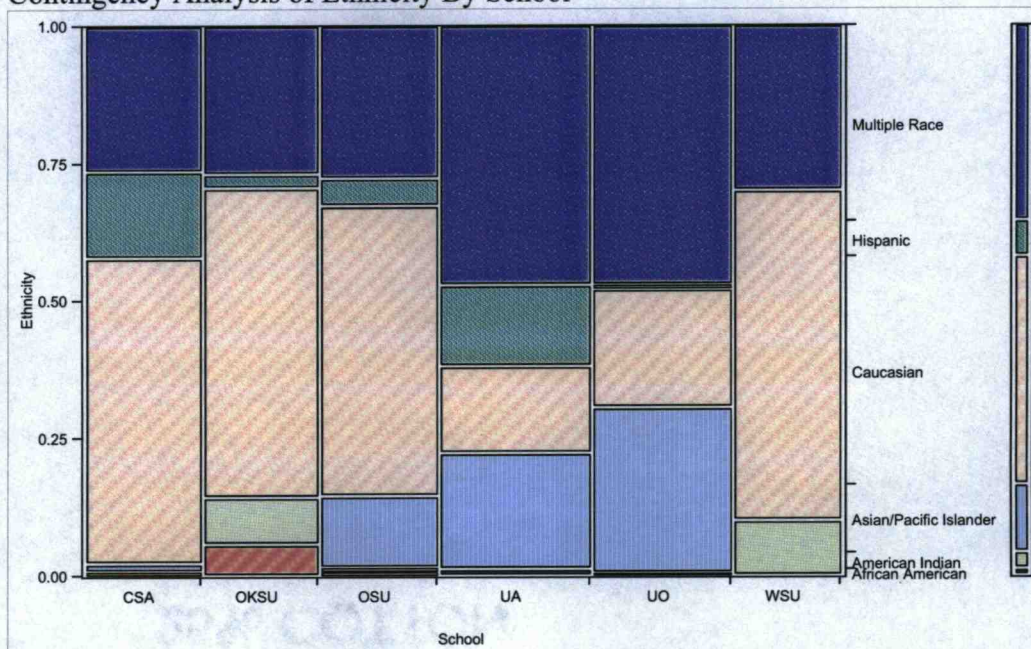
Figure 3. Percent of patients finding a match by ethnic group

Figure 4. Chi Square Results for comparing the total recruited number categorized by ethnicity between OSU and Peer Institutions

Contingency Analysis of Ethnicity By School



Contingency Table
School By Ethnicity

| Count Total % Col % Row % | African American | American Indian | Asian/Pacific Islander | Caucasian | Hispanic | Multiple Race | |
|------------------------------------|----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|--------------|
| CSA | 1 0.13 9.09 0.83 | 0 0.00 0.00 0.00 | 2 0.26 2.13 1.65 | 67 8.66 20.87 55.37 | 19 2.45 36.54 15.70 | 32 4.13 11.72 26.45 | 121 15.63 |
| OKSU | 7 0.90 63.64 5.88 | 10 1.29 43.48 8.40 | 0 0.00 0.00 0.00 | 67 8.66 20.87 56.30 | 3 0.39 5.77 2.52 | 32 4.13 11.72 26.89 | 119 15.37 |
| OSU | 1 0.13 9.09 0.81 | 1 0.13 4.35 0.81 | 16 2.07 17.02 13.01 | 65 8.40 20.25 52.85 | 6 0.78 11.54 4.88 | 34 4.39 12.45 27.64 | 123 15.89 |
| UA | 2 0.26 18.18 1.27 | 0 0.00 0.00 0.00 | 33 4.26 35.11 21.02 | 25 3.23 7.79 15.92 | 23 2.97 44.23 14.65 | 74 9.56 27.11 47.13 | 157 20.28 |
| UO | 0 0.00 0.00 0.00 | 1 0.13 4.35 0.69 | 43 5.56 45.74 29.86 | 31 4.01 9.66 21.53 | 1 0.13 1.92 0.69 | 68 8.79 24.91 47.22 | 144 18.60 |
| WSU | 0 0.00 0.00 0.00 | 11 1.42 47.83 10.00 | 0 0.00 0.00 0.00 | 66 8.53 20.56 60.00 | 0 0.00 0.00 0.00 | 33 4.26 12.09 30.00 | 110 14.21 |
| | 11 1.42 | 23 2.97 | 94 12.14 | 321 41.47 | 52 6.72 | 273 35.27 | 774 |

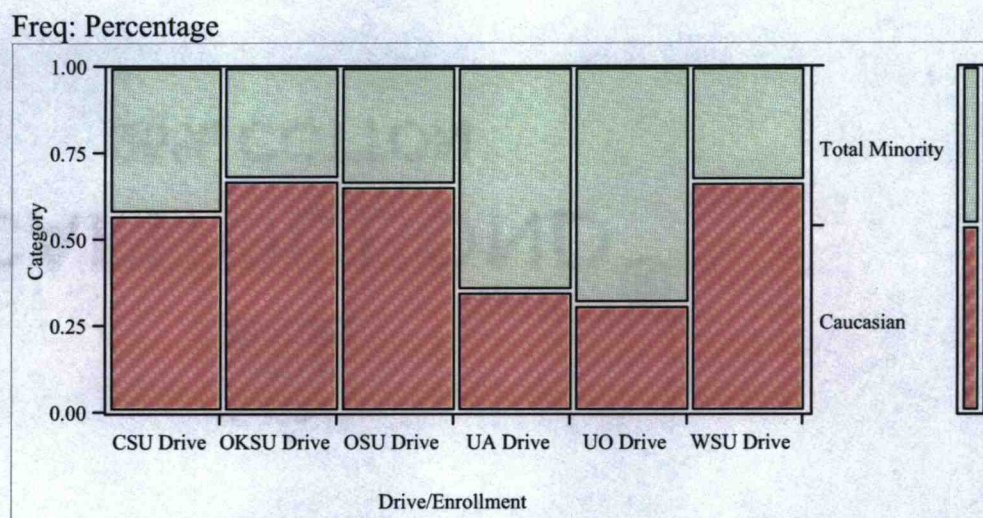
Tests

| | | | |
|----------|-----|-----------|-------------|
| Source | DF | -LogLike | RSquare (U) |
| Model | 25 | 155.9327 | 0.1509 |
| Error | 744 | 877.3379 | |
| C. Total | 769 | 1033.2706 | |
| N | 774 | | |

| | | |
|------------------|-----------|------------|
| Test | ChiSquare | Prob>ChiSq |
| Likelihood Ratio | 311.865 | <.0001 |
| Pearson | 281.563 | <.0001 |

Warning: 20% of cells have expected count less than 5, ChiSquare suspect

Figure 5. Chi Square Results for comparing the total recruited minority donors and recruited Caucasian donors between OSU and Peer Institutions



Contingency Table
Drive/Enrollment By Category

| Count Expected Deviation Cell Chi^2 | Caucasian | Total Minority | |
|--|-------------------------------|-------------------------------|-----|
| CSU Drive | 57 53.5 3.5 0.2290 | 42 45.5 -3.5 0.2692 | 99 |
| OKSU Drive | 67 53.5 13.5 3.4065 | 32 45.5 -13.5 4.0055 | 99 |
| OSU Drive | 65 53.5 11.5 2.4720 | 34 45.5 -11.5 2.9066 | 99 |
| UA Drive | 35 53.5 -18.5 6.3972 | 64 45.5 18.5 7.5220 | 99 |
| UO Drive | 31 53.5 -22.5 9.4626 | 68 45.5 22.5 11.1264 | 99 |
| WSU Drive | 66 53.5 12.5 2.9206 | 33 45.5 -12.5 3.4341 | 99 |
| | 321 | 273 | 594 |

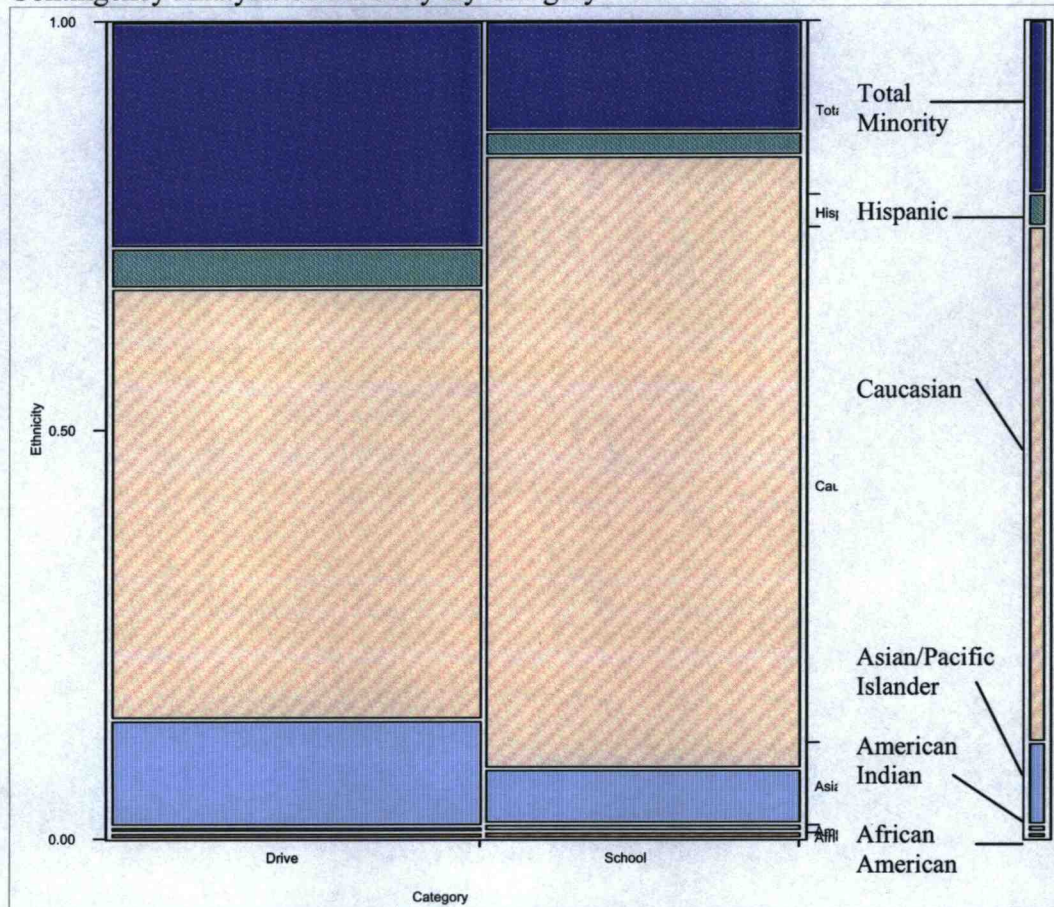
Tests

| Source | DF | -LogLike | RSquare (U) |
|----------|-----|-----------|-------------|
| Model | 5 | 27.45994 | 0.0670 |
| Error | 588 | 382.32797 | |
| C. Total | 593 | 409.78792 | |
| N | 594 | | |

| Test | ChiSquare | Prob>ChiSq |
|------------------|-----------|------------|
| Likelihood Ratio | 54.920 | <.0001 |
| Pearson | 54.152 | <.0001 |

Figure 6. Chi-Square Result for comparing the percentage of each ethnic minority or the total minority between OSU and the drive at OSU

Contingency Analysis of Ethnicity By Category



Contingency Table
Category By Ethnicity

| Count Expected Deviation Cell Chi^2 | African American | American Indian | Asian/Pacific Islander | Caucasian | Hispanic | Total Minority | |
|--|---------------------|--------------------|---------------------------|-----------|----------|-------------------|-----|
| Drive | 1 | 1 | 16 | 65 | 6 | 34 | 123 |
| | 1.0837 | 1.0837 | 12.4626 | 77.4846 | 4.87665 | 26.0088 | |
| | -0.0837 | -0.0837 | 3.53744 | -12.485 | 1.12335 | 7.99119 | |
| | 0.0065 | 0.0065 | 1.0041 | 2.0116 | 0.2588 | 2.4553 | |
| School | 1 | 1 | 7 | 78 | 3 | 14 | 104 |
| | 0.9163 | 0.9163 | 10.5374 | 65.5154 | 4.12335 | 21.9912 | |
| | 0.0837 | 0.0837 | -3.5374 | 12.4846 | -1.1233 | -7.9912 | |
| | 0.0076 | 0.0076 | 1.1875 | 2.3791 | 0.3060 | 2.9038 | |
| | 2 | 2 | 23 | 143 | 9 | 48 | 227 |

Tests

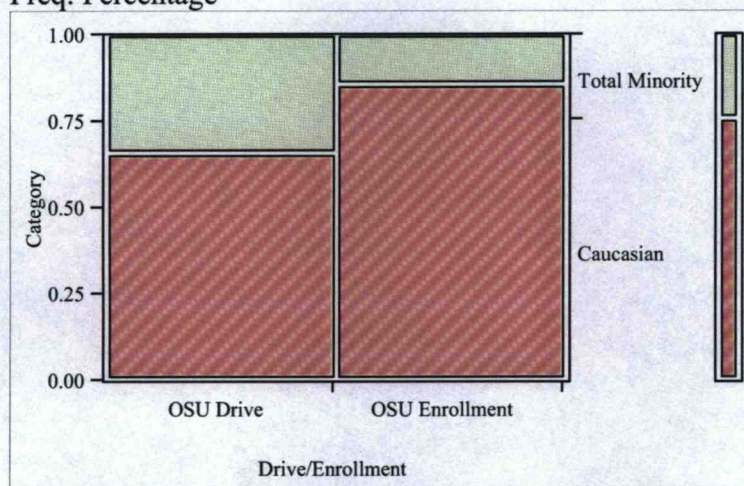
| Source | DF | -LogLike | RSquare (U) |
|----------|-----|-----------|-------------|
| Model | 5 | 6.41062 | 0.0266 |
| Error | 217 | 234.88462 | |
| C. Total | 222 | 241.29525 | |
| N | 227 | | |

| Test | ChiSquare | Prob>ChiSq |
|------------------|-----------|------------|
| Likelihood Ratio | 12.821 | 0.0251 |
| Pearson | 12.534 | 0.0282 |

Warning: 20% of cells have expected count less than 5, ChiSquare suspect

Figure 7. Chi-Square Result for comparing the percentage of total recruited minority donors and recruited Caucasian donors at OSU drive to the enrollment of total minority students and Caucasian students at OSU

Freq: Percentage



Contingency Table

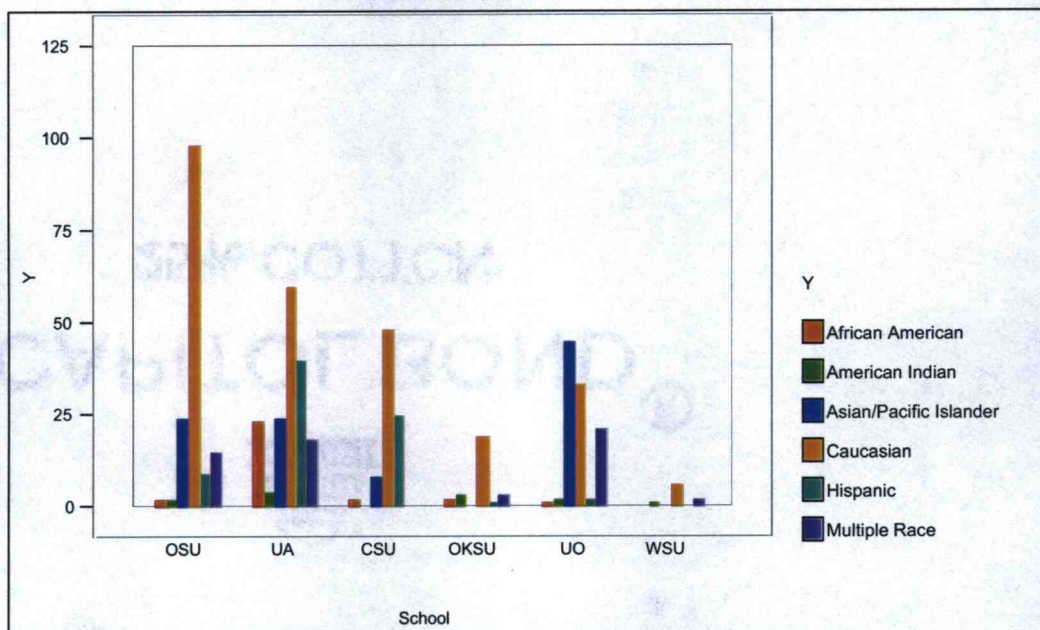
Drive/Enrollment By Category

| Count | Caucasian | Total Minority | |
|-----------------------|-----------|----------------|-----|
| Expected | | | |
| Deviation | | | |
| Cell Chi ² | | | |
| OSU Drive | 65 | 34 | 99 |
| | 75 | 24 | |
| | -10 | 10 | |
| | 1.3333 | 4.1667 | |
| OSU Enrollment | 85 | 14 | 99 |
| | 75 | 24 | |
| | 10 | -10 | |
| | 1.3333 | 4.1667 | |
| | 150 | 48 | 198 |

Tests

| Source | DF | -LogLike | RSquare (U) |
|----------|-----|-----------|-------------|
| Model | 1 | 5.63379 | 0.0514 |
| Error | 196 | 104.03014 | |
| C. Total | 197 | 109.66393 | |
| N | 198 | | |

| Test | ChiSquare | Prob>ChiSq |
|---------------------|-----------|------------|
| Likelihood Ratio | 11.268 | 0.0008 |
| Pearson | 11.000 | 0.0009 |
| Fisher's Exact Test | Prob | |
| Left | 0.0007 | |
| Right | 0.9998 | |
| 2-Tail | 0.0015 | |

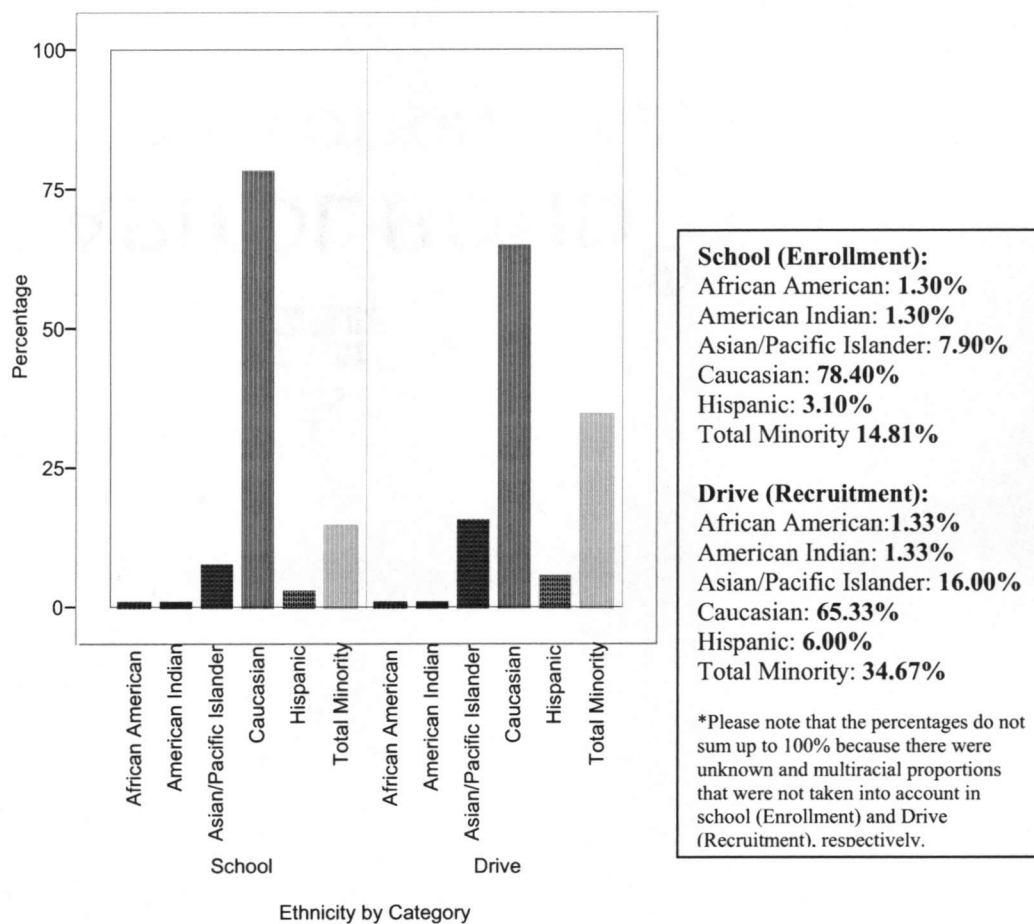
Figure 8. OSU's and peer institutions' recruitment data**Recruited number categorized by ethnicity**

| School | African American | American Indian | Asian/Pacific Islander | Caucasian | Hispanics | Multiracial | Total Minority | Total |
|--------|------------------|-----------------|------------------------|-----------|-----------|-------------|----------------|-------|
| OSU | 2 | 2 | 24 | 98 | 9 | 15 | 52 | 150 |
| UA | 23 | 4 | 24 | 60 | 20 | 18 | 109 | 169 |
| CSU | 1 | 0 | 2 | 52 | 15 | 7 | 25 | 77 |
| OKSU | 2 | 3 | 0 | 19 | 1 | 3 | 9 | 28 |
| UO | 1 | 2 | 45 | 33 | 2 | 21 | 71 | 104 |
| WSU | 0 | 1 | 0 | 6 | 0 | 2 | 3 | 9 |

Recruitment by percentage

| School | African American | American Indian | Asian/Pacific Islander | Caucasian | Hispanics | Multiracial | Total Minority |
|--------|------------------|-----------------|------------------------|-----------|-----------|-------------|----------------|
| OSU | 1.33% | 1.33% | 16.00% | 65.33% | 6.00% | 10.00% | 34.67% |
| UA | 13.61% | 2.37% | 14.20% | 35.50% | 11.83% | 10.65% | 64.50% |
| CSU | 1.30% | 0.00% | 2.60% | 67.53% | 19.48% | 9.09% | 32.47% |
| OKSU | 7.14% | 10.71% | 0.00% | 67.86% | 3.57% | 10.71% | 32.14% |
| UO | 0.96% | 1.92% | 43.27% | 31.73% | 1.92% | 20.19% | 68.27% |
| WSU | 0.00% | 11.11% | 0.00% | 66.67% | 0.00% | 22.22% | 33.33% |

Figure 9. OSU enrollment vs. OSU recruitment



APPENDIX C

Tables

Table 1. Enrollment: Oregon State University

| | | |
|---|------------------------------------|---------------|
| Total enrollment: | | 18,013 |
| Total undergraduate enrollment: | | 14,869 |
| Undergraduate enrollment by gender: | | |
| | Men: | 53.3% 7,925 |
| | Women: | 46.7% 6,944 |
| Undergraduate enrollment by race/ethnicity: | | |
| | Non-resident alien: | 2.9% 431 |
| | Black non-Hispanic: | 1.3% 193 |
| | American Indian or Alaskan Native: | 1.3% 193 |
| | Asian or Pacific Islander: | 7.9% 1,175 |
| | Hispanic: | 3.1% 461 |
| | White non-Hispanic: | 78.4% 11,657 |
| | Race-ethnicity unknown: | 5.1% 758 |
| | | 100.0% 14,869 |

Table 2. Enrollment: University of Arizona

| | | |
|---|------------------------------------|---------------|
| Total enrollment: | | 35,747 |
| Total undergraduate enrollment: | | 27,532 |
| Undergraduate enrollment by gender: | | |
| | Men: | 47.3% 13,023 |
| | Women: | 52.7% 14,509 |
| Undergraduate enrollment by race/ethnicity: | | |
| | Non-resident alien: | 4.2% 1,156 |
| | Black non-Hispanic: | 2.8% 771 |
| | American Indian or Alaskan Native: | 2.0% 551 |
| | Asian or Pacific Islander: | 5.7% 1,569 |
| | Hispanic: | 14.4% 3,965 |
| | White non-Hispanic: | 68.4% 18,832 |
| | Race-ethnicity unknown: | 2.5% 688 |
| | | 100.0% 27,532 |

Table 3. Enrollment: Colorado State University

| | | |
|---|------------------------------------|---------------|
| Total enrollment: | | 28,103 |
| Total undergraduate enrollment: | | 23,439 |
| Undergraduate enrollment by gender: | | |
| | Men: | 46.6% 10,923 |
| | Women: | 53.4% 12,516 |
| Undergraduate enrollment by race/ethnicity: | | |
| | Non-resident alien: | 0.9% 211 |
| | Black non-Hispanic: | 1.8% 422 |
| | American Indian or Alaskan Native: | 1.2% 281 |
| | Asian or Pacific Islander: | 2.5% 586 |
| | Hispanic: | 5.5% 1,289 |
| | White non-Hispanic: | 82.0% 19,220 |
| | Race-ethnicity unknown: | 6.1% 1,430 |
| | | 100.0% 23,439 |

Table 4. Enrollment: Oklahoma State University

| | | |
|---|------------------------------------|---------------|
| Total enrollment: | | 22,008 |
| Total undergraduate enrollment: | | 17,236 |
| Undergraduate enrollment by gender: | | |
| | Men: | 52.1% 8,980 |
| | Women: | 47.9% 8,256 |
| Undergraduate enrollment by race/ethnicity: | | |
| | Non-resident alien: | 4.7% 810 |
| | Black non-Hispanic: | 3.3% 569 |
| | American Indian or Alaskan Native: | 8.3% 1,431 |
| | Asian or Pacific Islander: | 1.7% 293 |
| | Hispanic: | 1.9% 327 |
| | White non-Hispanic: | 79.4% 13,685 |
| | Race-ethnicity unknown: | 0.8% 138 |
| | | 100.1% 17,253 |

Table 5. Enrollment: University of Oregon

| | | |
|---|---|--------|
| Total enrollment: | | 18,956 |
| Total undergraduate enrollment: | | 15,113 |
| Undergraduate enrollment by gender: | | |
| | Men: 46.8% | 7,073 |
| | Women: 53.2% | 8,040 |
| Undergraduate enrollment by race/ethnicity: | | |
| | Non-resident alien: 6.1% | 922 |
| | Black non-Hispanic: 1.6% | 242 |
| | American Indian or Alaskan Native: 1.0% | 151 |
| | Asian or Pacific Islander: 6.2% | 937 |
| | Hispanic: 2.8% | 423 |
| | White non-Hispanic: 74.0% | 11,184 |
| | Race-ethnicity unknown: 8.2% | 1,239 |
| | | <hr/> |
| | 99.9% | 15,098 |

Table 6. Enrollment: Washington State University

| | | |
|---|---|--------|
| Total enrollment: | | 21,073 |
| Total undergraduate enrollment: | | 17,476 |
| Undergraduate enrollment by gender: | | |
| | Men: 48.0% | 8,388 |
| | Women: 52.0% | 9,088 |
| Undergraduate enrollment by race/ethnicity: | | |
| | Non-resident alien: 3.5% | 612 |
| | Black non-Hispanic: 2.9% | 507 |
| | American Indian or Alaskan Native: 1.4% | 245 |
| | Asian or Pacific Islander: 5.1% | 891 |
| | Hispanic: 3.2% | 559 |
| | White non-Hispanic: 77.6% | 13,561 |
| | Race-ethnicity unknown: 6.3% | 1,101 |
| | | <hr/> |
| | 100.0% | 17,476 |

Table 7. Recruitment Data for University of Arizona

| <u>University of Arizona, Tucson:</u> | <u>Donors recruited:</u> | |
|--|---------------------------------|------------------------------------|
| | <u>October 1998:</u> | <u>Percentage in drive:</u> |
| Black non-Hispanic: | 23 | 13.61% |
| American Indian or Alaskan Native: | 4 | 2.37% |
| Asian or Pacific Islander: | 24 | 14.20% |
| Hispanic: | 40 | 23.67% |
| White non-Hispanic: | 60 | 35.50% |
| Multi-racial: | 18 | 10.65% |
| Total Minority: | 109 | 64.50% |
| Total: | 169 | |

Table 8. Recruitment Data for Colorado State University

| <u>Colorado State University, Fort Collins:</u> | <u>Donors recruited:</u> | |
|--|---------------------------------|------------------------------------|
| | <u>October 2000:</u> | <u>Percentage in drive:</u> |
| Black non-Hispanic: | 2 | 2.41% |
| American Indian or Alaskan Native: | 0 | 0.00% |
| Asian or Pacific Islander: | 8 | 9.64% |
| Hispanic: | 25 | 30.12% |
| White non-Hispanic: | 48 | 57.83% |
| Multi-racial: | 0 | 0.00% |
| Total Minority: | 35 | 42.17% |
| Total: | 83 | |

Table 9. Recruitment Data for Oklahoma State University

| <u>Oklahoma State University, Stillwater:</u> | <u>Donors recruited:</u> | |
|--|---|------------------------------------|
| | <u>October 2002¹:</u> | <u>Percentage in drive:</u> |
| Black non-Hispanic: | 2 | 7.14% |
| American Indian or Alaskan Native: | 3 | 10.71% |
| Asian or Pacific Islander: | 0 | 0.00% |
| Hispanic: | 1 | 3.57% |
| White non-Hispanic: | 19 | 67.86% |
| Multi-racial: | 3 | 10.71% |
| Total Minority: | 9 | 32.14% |
| Total: | 28 | |

¹ There was a drive in November 2000, but no one signed up.

Table 10. Recruitment Data for University of Oregon

| <u>University of Oregon, Eugene:</u> | <u>Donors recruited:</u> | |
|--------------------------------------|--------------------------|-----------------------------|
| | <u>February 1999:</u> | <u>Percentage in drive:</u> |
| Black non-Hispanic: | 1 | 0.96% |
| American Indian or Alaskan Native: | 2 | 1.92% |
| Asian or Pacific Islander: | 45 | 43.27% |
| Hispanic: | 2 | 1.92% |
| White non-Hispanic: | 33 | 31.73% |
| Multi-racial: | 21 | 20.19% |
| Total Minority: | 71 | 68.27% |
| Total: | 104 | |

Table 11. Recruitment Data for Washington State University

| <u>Washington State University, Pullman:</u> | <u>Donors recruited:</u> | |
|--|--------------------------------|-----------------------------|
| | <u>April 2002¹:</u> | <u>Percentage in drive:</u> |
| Black non-Hispanic: | 0 | 0.00% |
| American Indian or Alaskan Native: | 1 | 11.11% |
| Asian or Pacific Islander: | 0 | 0.00% |
| Hispanic: | 0 | 0.00% |
| White non-Hispanic: | 6 | 66.67% |
| Multi-racial: | 2 | 22.22% |
| Total Minority: | 3 | 33.33% |
| Total: | 9 | |

¹ 4/02 drive was done in a Pow-Wow.

Table 12. Recruitment Data for Oregon State University

| <u>Oregon State University, Corvallis:</u> | <u>Donors recruited:</u> | |
|--|--------------------------|-----------------------------|
| | <u>January 2003:</u> | <u>Percentage in drive:</u> |
| Black non-Hispanic: | 2 | 1.33% |
| American Indian or Alaskan Native: | 2 | 1.33% |
| Asian or Pacific Islander: | 24 | 16.00% |
| Hispanic: | 9 | 6.00% |
| White non-Hispanic: | 98 | 65.33% |
| Multi-racial: | 15 | 10.00% |
| Total Minority: | 52 | 34.67% |
| Total: | 150 | |

Table 13. People reached through meetings and listservs

| MEETINGS ATTENDED | APPROXIMATE NO. OF PEOPLE REACHED |
|--|---|
| APASU Meeting | 35 |
| Black Cultural Center Staff Meeting | 10 |
| Cultural/Resource Center Coordinator Meeting | 10 |
| Gamma Alpha Omega Meeting | 10 |
| Hispanic Student Union Meeting | 15 |
| Hui-O-Hawaii Meeting | 30 |
| Individual House Meetings | 120 |
| Inter-Fraternity Council Meeting | 30 |
| International Students of OSU Meeting | 20 |
| Isang Bansang Pilipino Meeting | 15 |
| Pan-Hellenic Meeting | 30 |
| Peer Health Advocate Meeting | 15 |
| Student Health Advisory Committee Meeting | 15 |
| Total (meetings) | 355 |
| LISTSERVS USED TO ANNOUNCE DRIVE | APPROX. NO. OF PEOPLE ON THE LISTS |
| APA Education Listserv | 1200 |
| Casa Educacional Listserv | 500 |
| Educational Opportunities Program Listserv | 700 |
| Indian Education Listserv | 200 |
| International Students of OSU Listserv | 200 |
| Student Involvement Listserv | 200 |
| Ujima Education Listserv | 200 |
| OSU Inform Listserv | 2900 |
| Total (listservs) | 6100 |

Table 14. People reached at information booths and presentations

| Event | No. of Visitors/Attendants |
|---------------------------------|---------------------------------------|
| Information booth (12/3/02) | 18 |
| Information booth (1/6/03) | 29 |
| Information booth (1/7/03) | 39 |
| Information booth (1/8/03) | 45 |
| Information booth (1/9/03) | 20 |
| Information booth (1/10/03) | 26 |
| Total Information booths | 177 |
| NAL Presentation | 2 |
| ACC Presentation | 0 |
| MU Presentation (12-1pm) | 2 |
| MU Presentation (5-6pm) | 2 |
| MU Presentation (4-5pm) | 4 |
| Total Presentations | 10 |

Table 15. Sources where people heard of the BMDRD

| EVALUATION RESULTS: SOURCE | |
|--|----|
| Friends | 42 |
| Barometer | 40 |
| Listserv | 30 |
| Information booth at the MU Student Lounge | 26 |
| MU Display Board | 17 |
| MU Leadership Room Presentation | 8 |
| Asian Cultural Center | 8 |
| Announcement in class | 7 |
| OSU This Week | 7 |
| Other student groups | 6 |
| MU Concourse | 5 |
| Asian Cultural Center Presentation ¹⁰ | 5 |
| Asian Pacific American Student Union | 5 |
| Individual greek house meeting | 5 |
| Faculty/Staff Fitness Program | 4 |
| Student Health Advisory Committee | 3 |
| APA Education | 3 |
| Panhellenic | 3 |
| Physical Activity Course Program | 2 |
| Ujima Education | 2 |
| Isang Bansang Pilipino | 1 |
| Lonnie B. Harris Black Cultural Center | 1 |
| Gazette-Times | 0 |
| Native American Longhouse Presentation | 0 |
| Hispanic Student Union | 0 |
| Centro Cultural Cesar Chavez | 0 |
| Native American Longhouse | 0 |
| Casa Educacional | 0 |
| Indian Education | 0 |
| Interfraternity Council | 0 |

¹⁰ Nobody actually attended the Asian Cultural Center presentation. The five people who indicated that they learned about the drive at the ACC presentation were referring to the presentation for the Asian Pacific American Student Union that also took place at the ACC.

Table 16. Demographic information and knowledge about marrow donation

| | | |
|--|------------|-----------|
| OSU Students | 99 | |
| OSU Faculty/Staff | 19 | |
| Community Members of Corvallis area | 11 | |
| | Yes | No |
| Did you know anything about marrow donation prior to this recruitment effort at OSU? | 67 | 62 |
| | | |
| Do you know how to keep your address updated with the NMDP? | 91 | 38 |

Table 17. Number of sources where people heard about the drive


| Number of sources where people heard about the drive | Number of people |
|---|-------------------------|
| 1 | 71 |
| 2 | 30 |
| 3 | 16 |
| 4 | 2 |
| 5 | 7 |
| 6 | 2 |
| 9 | 1 |

Table 18. BMDRD organization protocol

| Timeline | Activities |
|------------------------------|---|
| Spring Quarter (April-June) | <ol style="list-style-type: none"> 1. Form new steering committee 2. Set date for next year's drive 3. Distribute materials to the new committee 4. Goal setting 5. Budget setting 6. Preparation for fall orientation |
| Summer (July-September) | <ol style="list-style-type: none"> 1. Study materials 2. Prepare promotional materials with local donor center 3. Expand and identify the list of contacts |
| Orientation (late September) | <ol style="list-style-type: none"> 1. Attend new student orientation 2. Add BMDRD to the school calendar |
| Fall Quarter: October | <ol style="list-style-type: none"> 1. Reserve MU Display Board 2. Reserve information table 3. Reserve presentation room 4. Recruit educators, if needed 5. Contact student and community groups and set up meeting 6. Develop a press release 7. Create a flyer 8. Promotional materials translation |
| November | <ol style="list-style-type: none"> 1. Attend meetings 2. Set up information table 3. Promote the National Marrow Awareness month 4. Set up display board 5. Send press release 6. Gather volunteers |
| December | <ol style="list-style-type: none"> 1. Post flyers |
| Winter Quarter: January | <ol style="list-style-type: none"> 1. Set up information table 2. Education presentations 3. Place advertisements 4. Send out email to listservs 5. Actual BMDRD |
| February | <ol style="list-style-type: none"> 1. Evaluation meeting with the committee 2. Decide the future of the committee |

APPENDIX D

Poster for the Bone Marrow Donor Registration Drive



**You could
be the
missing piece!**



**Be a part of OSU's first
BONE MARROW DONOR
REGISTRATION DRIVE!**

**Monday, Jan. 13, 1pm-6pm
Tuesday, Jan. 14, 9am-1pm
MU Ballroom**

Information about becoming a
donor, the process for donation,
the National Donor Registry,
and more:

MU Student Lounge
(Across from the convenience store)
January 6-10, 11 a.m.-2 p.m.

Contact: Christy Tsang: tsangw@onid.orst.edu
Supported by OSU Multicultural Affairs
and Student Health Services



APPENDIX E

Sample of Email sent to Listserv

OSU'S FIRST BONE MARROW DONOR REGISTRATION DRIVE

Why are registered bone marrow donors needed?

More than 30,000 children and adults are diagnosed with life-threatening blood diseases such as leukemia in the U.S. every year. A transplant of stem cells, obtained from the bone marrow of a healthy donor, can cure these diseases. But only a quarter of patients find a matching donor within their family – most have to hope for an unrelated donor.

Why are we focusing on ethnic minorities?

Patients are more likely to find a matching donor within their ethnic community. However, many ethnic minorities are underrepresented on the National Marrow Donor Program (NMDP) registry. According to a study published in 2000, Caucasian patients have about an 80% chance of finding a bone marrow donor by searching the NMDP registry. In contrast, African-American patients find matches less than 30 % of the time.

How can you help?

Spread the word about the drive, and sign up on 1/13 and 1/14 to be a potential donor! On those days, the American Red Cross will be at the MU Ballroom to take a small blood sample for tissue typing. The results will be entered into the NMDP registry. All information will be kept confidential; the registry does not share any information with any outside parties.

Blood Sampling:

Date/Time: Monday, January 13, 2003, 1 p.m. - 6 p.m.

Tuesday, January 14, 2003, 9 a.m. - 1 p.m.

Location: OSU Memorial Union Ballroom

Cost: Minority (African American, Asian/Pacific Islander, Hispanic/Latino, Native American) and multi-racial individuals: Free

Caucasians: \$27 subsidized blood typing fee (first 50 volunteers go free)

Information Booths:

Date/Time: January 6-10, 2003, 11 a.m. - 2 p.m.

Location: OSU Memorial Union Student Lounge (across from convenience store)

Education Presentations:

Presentation 1: January 7, 2003, 3-4pm, Native American Longhouse

Presentation 2: January 7, 2003, 5-6pm, Asian Cultural Center

Presentation 3: January 8, 2003, 12-1pm, MU Leadership Center

Presentation 4: January 8, 2003, 5-6pm, MU Leadership Center

Presentation 5: January 9, 2003, 4-5pm, MU Leadership Center

Will you lose anything?

No, your body produces bone marrow every day. If some day, you are found to be a match for a patient and you agree to donate, the process will not compromise your body's immune system. Your body will replenish the donated marrow within 4-6 weeks.

Think about this:

Becoming a potential marrow donor is a big commitment. You will be on the registry until your 61st birthday. Donating bone marrow is not as simple as donating blood. However, it can be a gift of life for someone in need. You can give that second chance of life to others. You could be the missing piece.

For more information: Contact Christy Tsang, tsangw@onid.orst.edu or 737-6348

APPENDIX F
Institutional Review Board Application and Approval

INSTITUTIONAL REVIEW BOARD APPLICATION FOR HUMAN SUBJECTS RESEARCH
AT OREGON STATE UNIVERSITY

COMPARING THE BONE MARROW DONOR REGISTRATION DRIVE
AT OSU WITH PEER INSTITUTIONS

1. Brief Description:

By giving out the evaluation forms, we can find out through which media people heard about the Bone Marrow Donor Registration Drive. Knowing which ways are the most effective for recruiting people to sign up to the registry will be helpful for future reference and replication.

The result of the evaluation will be included in my thesis. It will also be part of the program's evaluation to get a general sense of what publicity and/or advertising works for this kind of registration drive.

2. Participant Population:

The evaluation forms will be passed out to people who come to the drive and sign up on the registry. They will receive the evaluation forms after the blood sampling is done. There is no restriction to gender or age, as long as the registrants fulfill the requirements for potential donors set by the National Marrow Donor Program (NMDP): Any person in general good health aged 18-60 can be on the registry. The estimated number of registrants at this drive is 200. Therefore, the number of people who will receive the evaluation form will range from 150-250.

3. Methods & Procedures:

The Bone Marrow Donor Registration drive is sponsored by OSU's Student Health Services and the Office of Multicultural Affairs. Volunteers have chances to become potential marrow donors on Jan 13 and Jan 14 at the Memorial Union Ballroom. Information regarding the procedures is provided prior to their consent to get on the registry, using the protocol of the NMDP. After their consent, American Red Cross staff will take a small sample of their blood for tissue-typing.

We will approach the donors and invite them to fill out an evaluation verbally after the last registration procedure is completed with the American

Red Cross. (See sample of verbal invitation) Volunteers are free to choose to participate in this activity. The evaluation forms will in no way allow the investigators to identify the participants. The estimated time commitment to fill out the evaluation form will be 3 minutes.

4. Risks:

There is no foreseeable risk associated with volunteers filling out the evaluation form to let us know where they heard about the Bone Marrow Donor Registration Drive. The only possibility would be participants feeling anxious and pressured to remember where they heard about the drive.

5. Benefits:

There is no direct benefit to the participants for filling out the evaluation form.

6. Compensation:

There is no compensation involved in this study.

7. Informed Consent Process:

The informed consent process will be done when the volunteers sign the informed consent form provided by the National Marrow Donor Program at the drive in the MU Ballroom.

A half-page informed consent form along with the evaluation will be given to the donor at the same time they receive the evaluation.

8. Anonymity and Confidentiality:

The participants will not be asked to provide their names on the evaluation form. The forms do not contain any questions that will allow investigators to find out the identity of the participants.

Informed Consent Statement

This Bone Marrow Donor Registration Drive (BMD) involves an evaluation component to see which medium or combination of media used was most effective in recruiting potential donors. The approximate time to fill out this evaluation is three minutes. Your participation in completing this evaluation is completely voluntary. If you agree to participate in this evaluation process, please read the evaluation and check all boxes apply.

While there are no foreseeable risks or direct benefits to you associated with filling out the evaluation form, your input is extremely valuable. We do not wish to identify any participant in this evaluation process, therefore please do not write your name on the evaluation or put any marks that we can possibly identify you.

The information you provide through this evaluation form will be compiled and published in the future to enhance future's BMD. If you have any questions or concerns regarding this evaluation process, please contact Christy Tsang at tsangw@onid.orst.edu or Dr. Anne Rossignol at Anne.Rossignol@orst.edu. If you have any questions about your rights as a participant in this evaluation, please contact the Oregon State University Institutional Review Board (IRB) Coordinator at IRB@oregonstate.edu or (541) 737-3437.

Please keep a copy of this form for future reference. Please place the completed evaluation in the box at the end of the table.

Sample of verbal invitation to fill out an evaluation form:

"Hi, we would like to ask if you have a few minutes to fill out this evaluation form for us. The information will help the organizers for further improvement of the organization of this drive."

If yes: "Here is an informed consent form explaining more on the evaluation, and also here is the evaluation form. Please read the informed consent and an evaluation form. If you decide to fill out the evaluation form, you can return the forms at the box labeled over there."

If no: "Thank you for coming."