

BARRIERS TO VOLUNTEERISM IN THE OREGON DENTAL COMMUNITY

By

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ABSTRACT

Oral health is an important contributor to overall health. Over 500,000 Oregonians need dental care but go without because they cannot pay. Many low income people rely on volunteer dentists in nonprofit organizations such as Medical Teams International (MTI) for urgent care. The purpose of this study was to describe the changes in volunteerism among dentists in the Mobile Dental Program at MTI, to determine the factors affecting volunteer interest and retention, and to recommend steps to increase volunteerism.

Growth of the program, measured by hours donated, number of dentists volunteering, and number of clinics held, decreased between 2003 and 2012. The fractional change in number of volunteers showed a consistent negative relationship with time ($p=0.012$), with an average decline in growth of three percentage points per year. Hours served and clinics held showed similar patterns. Joinpoint regression analysis of monthly data confirmed that growth of the program was positive during the first part of the decade, but was not different from zero during the second part.

Relatively few individuals do most of the work in this program: in 2012, 43% of all 214 volunteers served in only one clinic and 20% of the total clinics were covered by five dentists. The fraction of patients who are under 18 fell from 34% to 15% over the past five years ($p<0.001$).

We used focus groups and an electronic survey to assess motivations for and barriers to volunteering. “Making a difference” in patients’ lives and professional responsibility received the highest rankings as motivators. Volunteering in alternative programs was ranked as the #1 barrier (48.8% of respondents ranked this choice #1). Cramped facilities and/or outdated equipment were ranked #2, and a preference for working only with

patients of a particular age was ranked #3. In response to Likert-type questions, the fraction of respondents indicating they “strongly agreed” or “agreed” that a factor limited their service was as follows: not having time (34.2%), personal financial commitments (27.0%), volunteering elsewhere (24.3%), preference not to do some procedures (14.4%), need to pay off school loans (12.6%), patient age or other demographics (12.6%), patient needs not urgent (12.5%), facilities (10.8%), uncomfortable with some patients (5.4%), personal health (4.5%), clinic scheduling issues (3.6%), and difficulty working with MTI staff or other volunteers (2.7%).

We built a model using logistic regression methods and survey data, using the number of times a dentist volunteered in the past year (≤ 1 or ≥ 2) as the dependent variable. We considered eight independent variables: retirement status, age, sex, practice specialty, practice setting, dental school community dentistry experience, and motivation by professional responsibility and religious faith. The final model included only retirement status (OR = 6.59, $p=0.025$) and faith (OR = 3.51, $p=0.004$) as significant contributors to volunteerism.

The most important contributors to this change in volunteerism are factors external to the program itself and not directly under the control of MTI. However, there are a number of specific changes that can be made that should help to restore program growth for the coming years.

Introduction

Oral health is recognized as an important contributor to the overall health of an individual, directly associated with respiratory and cardiovascular health and indirectly affecting overall health status through the ability to get adequate nutrition. About one in four U.S. adults have untreated tooth decay, and the prevalence of untreated dental caries is over 40% in low-income adults (35). In Oregon, it is estimated that over 500,000 people are in need of dental care but go without because they cannot pay for it. Because dental disease is progressive and adversely affects overall health, this is an important public health problem. One approach to addressing acute dental health needs in Oregon's low income population utilizes the services of volunteer dental professionals working through nonprofit organizations to provide care for urgent needs. However, the motivations of those who volunteer, and the barriers for those who do not, have not been studied. The present project examines factors that are reported to motivate, or act as barriers to, dentists choosing to contribute time as volunteers in a non-profit organization that provides care to communities using mobile dental vans.

Literature review. There is a paucity of literature regarding domestic volunteerism among dental professionals. Most of the articles located with an electronic literature search on this topic are in journals of local (state) dental societies, not readily available, and appear to be first-person accounts of volunteer experiences or editorials rather than research papers (5,14,16,18,25,26). One notable exception to this generalization is in the area of dental education, in which interest in cultural competence and community dentistry, including volunteerism, has been active and growing over the past decade (22,23).

Several programs have been developed to strengthen cultural competency in students at

the dental school level. At the University of Pittsburgh, a program of non-dental community service (“SCOPE”, Student Community Outreach Program and Education) improved cultural competence and a sense of social responsibility in students who participated (22,23). Results from another study indicated that, although most dental schools (82% of those responding) did not have a stand-alone cultural competency course in 2006, the majority did report integrating these principles into the regular curriculum (21). Information from that study could be used as a baseline for future work, and raises the issue of whether some form of standardization is needed across dental schools in the area of cultural training. Another program designed to address cultural competency is the Pipeline, Profession, and Practice: Community-Based Dental Education program (11). Fourteen U.S. dental schools received funding for this 5-year program (2002-2007), which involved revising the curriculum to increase cultural competency among students. The long-term effects of these efforts are not yet clear, but ideally they will not only raise cultural awareness in the dental profession, but also lead to increases in the desire to volunteer in underserved communities in the U.S. and abroad. Finally, Gadbury-Amyot et al. describe a multifaceted approach to ethics instruction that included a community-based service-learning component (8). Over the short term, dental and dental hygiene students’ attitudes toward volunteerism were significantly improved after the 7-week course, particularly among female students. However, the extent to which these attitudes will carry over into the practices of these students is not yet known.

If one expands a literature search to include international volunteerism, more information is available (13,28). The papers retrieved from this expanded search tend to focus on addressing the problems of “medical tourism”, pointing out that short-term provision of

clinical treatment in low income, often rural, international settings has little if any long-term benefit to the local community and can actually be detrimental (12). In general, teaching local health workers to provide ongoing care (rather than serving as providers themselves), implementation of simple oral health care concepts, long-term community development, and advocacy work are thought to be more appropriate roles for volunteers (2,10,12,13,27). Although understanding the issues of cultural competency that arise in international work can certainly provide lessons applicable to domestic volunteerism, many of the other themes do not directly transfer to community dentistry within the U.S. However, one way in which the growth of international dental volunteerism may impact the present project is through competition for volunteers between international and local volunteer opportunities. In other words, as international service trips have become more popular and available, some dentists may have chosen to do international over domestic volunteer service.

A few studies have looked at interest in volunteerism in other health professions. Results of a survey administered to all resident members of the American College of Surgeons suggested widespread interest in international surgical experience and plans to volunteer while in practice (19). The most frequent barriers identified by respondents in this study were financial and logistical. A similar study of pediatric surgeons indicated that they too had a high interest in international volunteer work (4). The respondents indicated that altruism was their chief motivation, and 80% wished to train local surgeons as part of their overseas experience. The main barriers they identified were family obligations and a lack of time.

Overall, volunteers are a valuable resource for nonprofit organizations and thus for communities. However, retention is a huge problem: approximately one third of the people who reported volunteering in 2006 did not do so the following year (7). Thus, many nonprofits are losing volunteers at an alarming rate. Although in most nonprofits the volunteers' role is to support the paid staff in accomplishing their mission, in some situations (particularly within the health care field), the volunteers actually *are* the program. For all of the organizations that utilize volunteer health professionals to provide services, the volunteers do not merely *support* the ongoing work of the organization, they literally *do* that work. Thus, it will be important to identify the barriers to volunteerism within these organizations, and to learn how nonprofits can keep the volunteers they have, as well as attract new volunteer talent.

Background. As with other health professions, the dental profession has a long tradition of concern for the overall health of the communities it serves, as well as that of individuals within the community who are disadvantaged. Historically, dentists and other dental professionals have felt a sense of responsibility to treat patients who have oral health needs, even if they are uninsured and unable to pay out of pocket for the services provided. At times this has meant including such patients as part of the regular practice, however more recently nonprofit organizations and dental societies have developed programs that are specifically designed to utilize volunteer dental professionals to treat indigent patients in settings outside of the regular dental office.

One such venue is the Mobile Dental Program of Medical Teams International (MTI). Begun in 1989, this program currently operates 11 dental vans in Oregon and Washington (and 2 in Minnesota). These vans are essentially dental offices on wheels, each housing

two dental operatories and a small laboratory, with the capability to support common dental procedures such as extractions, restorations (fillings), and x-rays. Each van is staffed by a paid manager, who may or may not have credentials as a dental assistant, and by 1-2 licensed volunteer dentists and 1-2 volunteer dental assistants. The vans are based at various locations throughout the state, travel to both urban and rural sites, and work with partner social service agencies who schedule the patients for each day. Over the past ten years, the Mobile Dental Program has served approximately 84,000 patients in Oregon, utilizing the services of approximately 700 volunteer dentists and nearly 3000 dental hygienists, assistants, and students.

Recently, MTI staff members have noticed what appears to be a reduction in the availability of volunteer dentists to staff the mobile dental clinics. The perception is that fewer dentists are volunteering. However, this hypothesis has not been tested.

Furthermore, if the face of volunteerism has indeed changed over the past several years, the reasons behind these changes are not known. An apparent reduction in interest in volunteering might be due to the implementation of new, competing volunteer programs in the community or a move to see indigent patients within the regular dental office, a change in the demographics of the patient base, factors controlled by the partners who schedule patients for clinics, financial factors, and/or a reduced sense of altruism and professional social responsibility among newly trained dental professionals (see Figure 1).

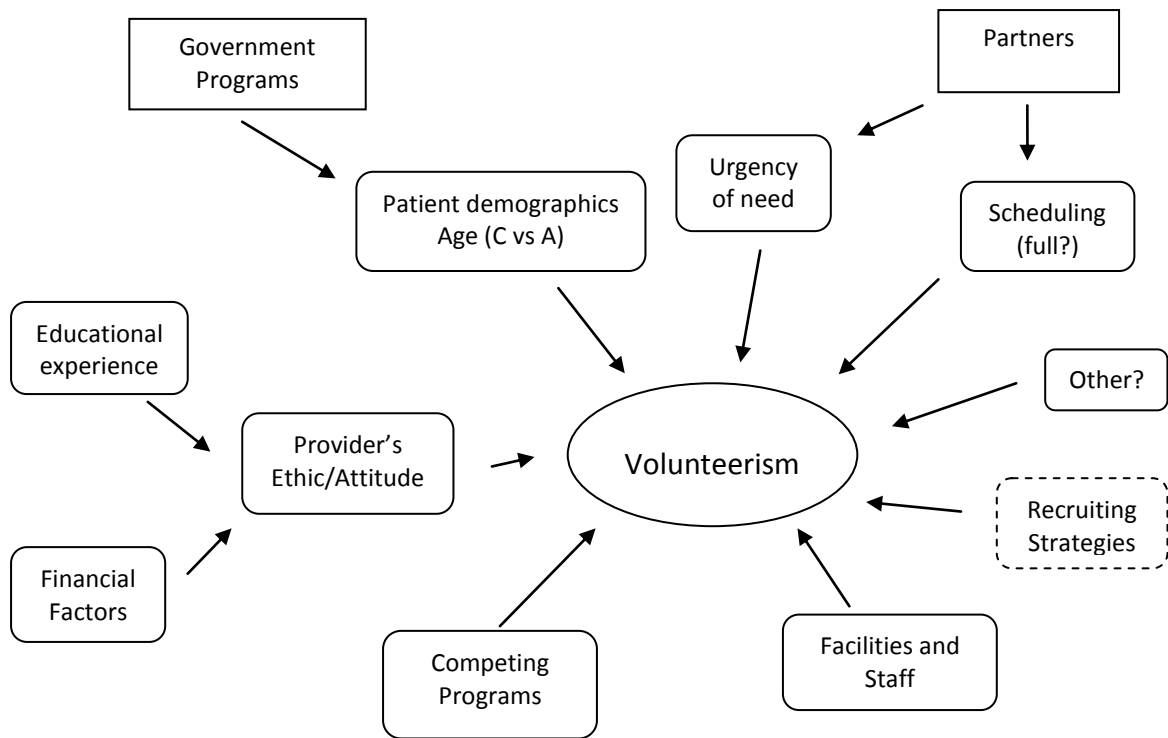


Figure 1. Potential factors affecting volunteerism.

Competing programs. One factor that could help to explain a reduction in volunteer activity or frequency at MTI is the recent initiation of other programs within the community, programs that effectively compete with MTI for volunteers from the existing dental professional volunteer pool. For example, the Tooth Taxi, sponsored by the Dental Foundation of Oregon (the charitable arm of the Oregon Dental Association), OEA Choice Trust, and ODS Health, is a mobile dental van program that was launched in 2008 (30). This program has one dental van that visits schools throughout Oregon to provide free dental care and oral health education to uninsured and underserved children. The Tooth Taxi has a paid full-time dental staff, but also uses volunteers from time to time. In the last four years, the Tooth Taxi has visited 177 schools throughout Oregon, serving

over 11,000 children and delivering over \$3 million in donated goods and services.

Another new program providing dental care to the underserved is the Oregon Mission of Mercy, sponsored by the Oregon Dental Association (ODA) (36). Begun in November of 2010, the OrMOM is an annual two-day dental clinic with numerous portable dental stations set up in a large public arena. The first two clinics were held in the Portland area, whereas the third was held in Medford, in the southern part of the state. The 2011 event involved approximately 800 dentists, assistants, and hygienists, who provided over \$1,200,000 worth of treatment. ODA also participates in the National Dental Access Day called Give Kids a Smile! (31). Begun in 2003 by the American Dental Association, this program provides prevention education and free treatment for uninsured children around the country. Another volunteer dental service group is part of the Compassion Connect network (34). Compassion Connect is an organization that helps bring churches together to serve their neighbors. Beginning in 2006, Connect Clinics, which include free medical and dental services, are now offered at a variety of sites. In 2012, twelve separate clinics were offered in the greater Portland area, serving 1,518 dental patients. It is evident that the latter three programs are only one- or two-day annual events, and thus do not provide ongoing care. However they also do not require an ongoing commitment by the provider, which may appeal to some volunteers.

Thus, a number of new free dental programs have begun in the past six years, offering new and varied opportunities for dental professionals to volunteer their services. It may be that some aspects of these new programs (e.g. sponsorship by the ODA, participation with colleagues, etc.) make them more attractive venues for volunteer service than are the MTI Mobile Dental Program vans, and thus former MTI volunteers may have moved to

these new programs. Importantly, most of the programs mentioned above are restricted to metropolitan areas of the state, and would likely not have a big impact on volunteerism in rural areas remote from large cities.

As indicated above, historically dentists have sometimes provided care within the context of their regular dental practices to patients who are unable to pay. There are likely some dentists who continue to find this venue preferable, as all of their desired supplies and equipment are familiar and readily available during procedures. They may also perceive the mobile vans as cramped, or have difficulty working with other volunteers or MTI staff. Thus, incorporating free care for indigent patients into a regular practice may be preferred. However, there is no particular reason to think that the proportion of dental professionals opting to deliver free care in this venue, as opposed to other programs, has increased over the past few years.

Patient demographics. Another factor that could affect volunteerism is a change in patient demographics, and in particular, patient age. There are a number of reasons why volunteer dental professionals may prefer to serve children rather than adults (17). Children are generally thought to be poor through circumstances not of their own making, whereas adults in poverty are often perceived to be at least partially responsible for their situations (usually thought to be because they have made some poor choices). Thus, children may be considered to be more deserving of free care. Professionals also tend to feel that children can learn good oral hygiene habits, thus making it possible to have a long-term impact on a patient's health, whereas adults are thought to be unlikely to change their habits or make substantial lifestyle changes as a result of interaction with the

volunteer. Finally, children have teeth that can be saved, whereas in many indigent adults dental disease has progressed to the point at which there is little hope for restoring oral health.

Because of recent changes in governmental programs, the fraction of MTI dental patients who are below the age of 18 has fallen dramatically. The Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA), effective as of October 1 of that year, mandates that all children will have a base level of dental coverage included in their benefit package (29,33). In Oregon this program is administered through the Oregon Health Plan (OHP). Although many providers do not accept OHP patients, and some children still fall through the cracks (6), children are now more likely to receive services covered by OHP and thus are less likely to present at a MTI mobile dental clinic. This change in patient demographics may make the volunteer experience feel less rewarding and fulfilling, and could reduce the enthusiasm and willingness of some dental professionals to volunteer.

Financial factors. Financial factors might also play a role in causing a decline in volunteerism among dentists. In 2011, seniors graduating from U.S. dental schools had an average debt of over \$180,000 (32). After adjusting for inflation, this is about twice the level of debt incurred by students graduating in 1990, and 21% more than the average graduating senior debt in 2005. This does not even take into account the start-up costs of beginning a new practice. Upon graduation, it is also reasonable for new graduates to want to begin to upgrade their standard of living beyond the level at which many students function, for example buying a home rather than renting an apartment. Thus, new dentists

may feel considerable pressure to extend their paid working hours so that they can generate enough income to pay off school loans as well as enjoy a slightly more affluent lifestyle. They may feel that they cannot afford to donate their time.

Another financial factor that could contribute to a reduction in ability to volunteer relates to the downturn in the U.S. economy that began in 2008. Traditionally, many dental hygienists and dental assistants work only part time. It is possible that as spouses lost jobs or experienced reduced incomes, these dental professionals had to pick up additional hours to make ends meet within their families. This would leave them with less free time to do the volunteer work they had been doing in the past. Although this scenario is postulated to be a factor for non-dentist professionals, some dentists might also have experienced similar situations.

Factors controlled by service partners. MTI does not do the patient scheduling for their dental clinics, but rather relies on the individual partner organizations to screen and schedule patients. Often the patients are part of a regular client base served by the partner organization. Providers generally appreciate seeing patients with truly urgent needs (which is the goal of the Mobile Dental Program) in a clinic with a schedule that is full (i.e. no wasted time) but not hectic. It is possible that some partners have done a poor job of scheduling some clinics, such that providers feel their time is not well-utilized or that they are too rushed to do their best for the patients. Some partners may also schedule too many patients with needs that prove not to be urgent, thus preventing those with truly urgent needs from being seen in that clinic. This could lead to frustration and a lack of

enthusiasm for the program among volunteer dentists. However, the extent to which this is a barrier to volunteerism is not known.

Altruism and social responsibility. Much has been written over the past two decades about the meaning of professionalism and the role of dental professionals in addressing the oral health needs of the entire community, including those citizens who do not have the financial means to pay for care (1,5,17,20). Some are concerned that overall, among dentists the sense of professional responsibility to devote a portion of their efforts to serving the uninsured and indigent members of their communities has dwindled. Among dental students, their altruistic attitudes and sense of responsibility for the oral health of the entire community decline from the first to the fourth year of training (9). Thus, it may be that newer graduates are less interested in “giving back” to their communities than are those who graduated several decades ago. Many dental schools have begun to include community-based educational experiences into their curricula in an effort to increase and widen educational opportunities for their students as well as to provide care for underserved local populations. These programs appear to have the potential to improve students’ attitudes toward and comfort with underserved groups of patients, although it is not clear whether they will have a big impact on the students’ commitment to volunteerism over the long haul.

Recruitment strategies. The Mobile Dental Program at MTI does not have an aggressive recruitment strategy for attracting new volunteers. They do maintain a presence at dental organization functions, such as the annual Oregon Dental Association meeting, where providers who wish to volunteer may sign up. Beyond that, they rely primarily on word

of mouth for recruitment. Once a provider is on the volunteer list, he/she will be called and scheduled to serve in mobile clinics at times that are mutually convenient. Although these “soft” recruitment strategies have not changed over the past ten years, a change in this variable may eventually prove to be an appropriate and necessary response to a decline in volunteer self-referrals.

In summary, competing programs, changing patient demographics, partner factors, financial factors, and a dwindling sense of social responsibility may all contribute to a reduction in volunteerism among dental professionals serving at MTI. However, the relative importance of each of these factors is not known. In order to continue to provide dental care to the people MTI serves, it will be important to understand whether there has been a real reduction in the spirit of volunteerism among dental professionals, to identify the root causes of such a reduction, and to identify possible solutions to these issues.

The goals of this project were: 1) to describe the changes in volunteerism in the Mobile Dental Program at MTI between 2003 and 2012, and possible causal factors; 2) to determine the factors affecting volunteer activity and retention in dental professionals who have volunteered at least once with MTI over the past 10 years; and 3) to make recommendations, based on the results of the study, regarding steps that could be taken to increase the number of dental professionals volunteering for the program, to increase the average number of hours per year a volunteer will donate, and to increase retention of volunteers. We tested the hypothesis that the growth of the program, measured by the number of hours donated, the number of dentists volunteering, and the number of clinics held, has decreased between 2003 and 2012. (As MTI does not actively recruit volunteers, this was considered to be an indication of interest in and willingness to

volunteer.) We also tested the hypothesis that a change in patient demographics (specifically a reduction in the percentage of patients who are children), the advent of competing programs, and factors affecting the providers' ethic/attitude (including educational experience with community dentistry and financial factors) are the major determinants of the reduction in volunteerism.

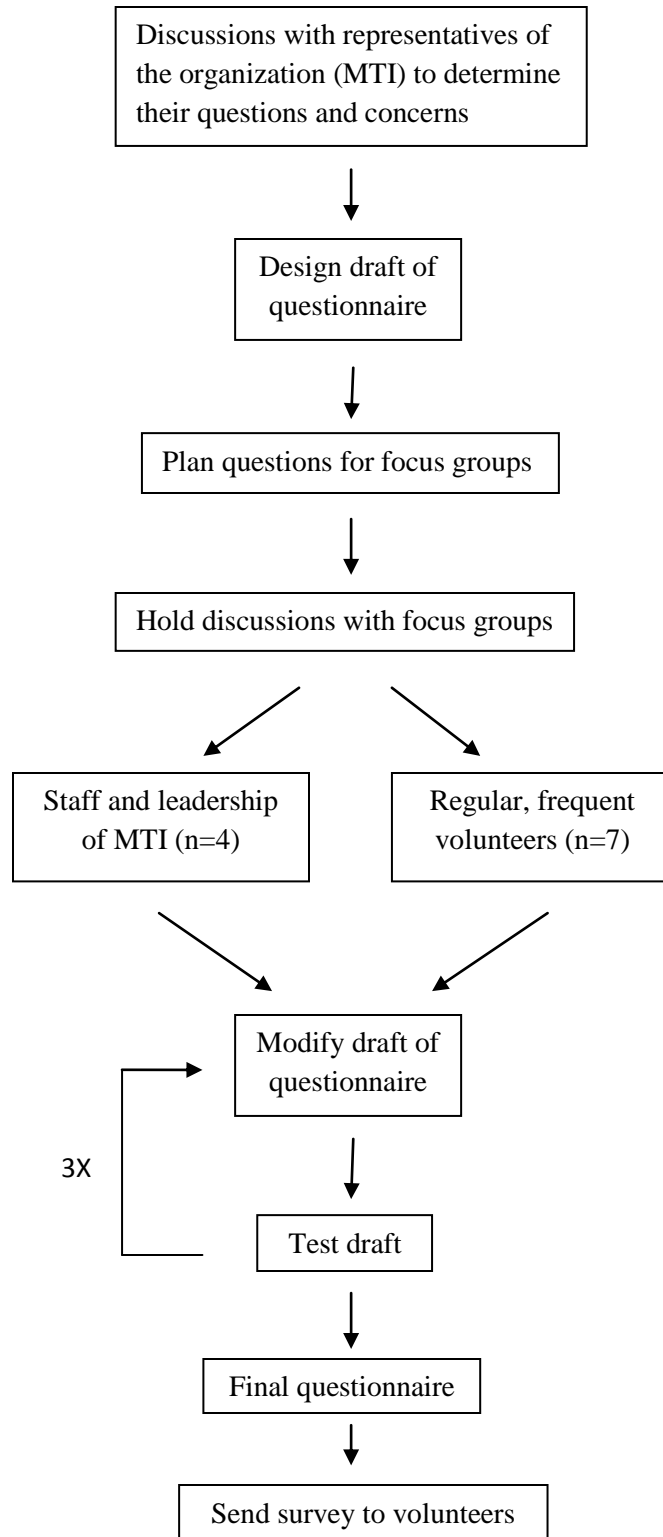
Methods

We utilized a mixed methods approach. Data were collected from focus groups, existing volunteer records, and an electronic survey, and analyzed using descriptive statistics, Joinpoint regression, and logistic regression techniques. All procedures were approved by the Institutional Review Board of Oregon Health & Science University (IRB00009265).

For *Specific Aim #1*, we utilized de-identified records of volunteer service kept by MTI over the past 10 years. We did a descriptive analysis, looking at service patterns, including number of volunteers, number of clinics, numbers of new and repeat volunteers, and number of hours of service by individual volunteers within the Mobile Dental Program from 2003 through 2012. This allowed us to determine whether changes in volunteer patterns have occurred over the time period in question, and what specifically had changed. We also looked at patient demographics (particularly age) by year.

For *Specific Aim #2*, our goal was to conduct a survey of volunteer dentists to determine their motivations for volunteering as well as their perceived barriers to volunteering within the Mobile Dental Program. The flow chart for preparing and administering the survey is shown in Figure 2. To assist us in formulating the survey questionnaire, we held

Figure 2. Flow chart depicting the process for survey design.



two focus groups, one made up of four MTI Mobile Dental staff members and one made up of seven current and previous volunteer dentists. The questions in Appendix B were used to guide the discussion in each group.

We designed a survey to address possible factors influencing volunteerism within the Mobile Dental Program. The specific factors to be considered included: 1) changes in patient demographics (possibly due to recent changes in government programs); 2) factors related to partner organizations, including perceived urgency of need of the patients and scheduling issues; 3) factors related to the providers themselves, including year of graduation from dental school, past educational experiences in community dentistry, and financial factors such as outstanding educational debt; 4) initiation of alternative opportunities for volunteer service (competing programs); and 5) level of satisfaction with Mobile Dental Program facilities and ease of working with other volunteers and MTI staff.

We administered the electronic survey to all dentists for whom valid e-mail addresses were available who had volunteered in the Mobile Dental Program at least once since the beginning of 2003. Six hundred ninety-nine dentists volunteered over this time period; 579 of these individuals had e-mail addresses listed in the MTI volunteer database. Using publications such as the directories of local dental societies, and phone calls to the numbers listed in the volunteer database, we were able to secure e-mail addresses for an additional 44 volunteer dentists. Three of the dentists on the original list were known to be deceased. We sent the survey link to 620 dentists, and 90 of these e-mails came back

as undeliverable. We thus estimate that 530 invitations were received; we do not know how many of these were opened.

The electronic survey approach had several advantages. It was inexpensive, which was an important consideration for this thesis project, which had no outside funding. It was also relatively quick to administer and yielded results quickly, both of which are critical when conducting a Master's thesis project. Interviewer bias was minimized. Because the data were already in electronic form, there was no need for data entry, which saved time as well as minimizing possible data entry errors. Electronic surveys have also been shown to yield a better response rate than pencil-and-paper surveys (24). Finally, conducting the survey electronically obviated the need for travel to remote parts of the state to conduct interviews, and also allowed the subjects to provide the information at a time that was convenient for them.

The major disadvantage of this approach is that there was no opportunity for clarification of questions/answers as there would be if interviews were conducted in person. However, we took steps to design the questionnaire carefully, so that the questions were as clear as possible, which should have minimized misunderstandings. Furthermore, the population we surveyed was a group of highly educated professionals, who should have had no difficulty understanding the English language. Confusion due to cultural factors should also have been minimal in this group.

Survey design. A flow chart depicting the process for the survey design is shown in Figure 2. The first step was to hold discussions with representatives of the organization (MTI) to determine their questions and concerns, which allowed us to form general

questions about the program. We completed this step in order to arrive at our overarching question regarding changes in volunteerism at MTI, as well as our stated hypotheses. The second step was to design a first draft of the survey, addressing the hypotheses we had formulated using multiple choice, ranking, Likert-type, and open-ended questions. We then met with two different focus groups to gain their thoughts and insights into the topic. The following questions were used to guide the focus group discussions:

Q1: Do you believe that a lack of access to good dental care is an important issue for low income individuals, and thus an important public health problem, in Oregon?

Q2: What do you feel are the most important factors that motivate dentists to volunteer their services to low-income patients?

Q3: What do you feel are the most important barriers to volunteerism among Oregon dentists (in other words, what would limit or prevent dentists from volunteering their services in the Mobile Dental Program or elsewhere)?

Q4: What are specific aspects of the MTI Mobile Dental Program that you feel might prevent or limit volunteerism among Oregon dentists? Which of these are the most important barriers?

Q5: (The facilitator mentioned any of the potential barriers included in our hypotheses that did not come up spontaneously in the focus group discussion.) How important do you feel each of these additional potential barriers is in limiting volunteerism?

The first focus group consisted of four representatives of the staff and leadership of the MTI Mobile Dental Program. The second group consisted of seven dentists who have

volunteered in the program and/or are on the advisory board for the Mobile Dental Program. After holding the focus group meetings, we used the information gained to modify the survey questionnaire. We then tested this draft to assess clarity, length, face validity, etc. Based on the results, we made modifications in the questionnaire to improve it. We then re-tested it. After several iterations of this process, we arrived at the final questionnaire. The final survey is presented in Appendix C. It consisted of 40 total questions including 13 Likert-type questions and two ranking questions, and utilized skip logic to ask follow-up questions when the answers to the Likert-type questions indicated agreement or strong agreement with a statement.

Administration of survey. We conducted the survey electronically using Survey Monkey (www.surveymonkey.com). The survey link was sent to volunteers in a letter (e-mail) of introduction and support from Jeff Pinneo, the CEO of Medical Teams International. This cover letter briefly introduced the investigator, explaining the importance of the study and encouraging participation. We sent the survey link to all volunteer dentists, requesting their participation and indicating that the link would be open for two weeks. We stressed that anonymity of participants was guaranteed. One week later, we sent another e-mail, a “friendly reminder” that the survey was in progress, thanking those who had completed the survey for their participation and requesting that those who had not yet participated do so. We sent a similar reminder three days before the survey closed. The text for these e-mails is available in Appendix D.

Analytic methods. To further assess growth of the program, we used Joinpoint regression analysis on monthly data. Joinpoint methods fit a set of line segments to trend data and

produce estimates of the time points (and corresponding confidence intervals) at which rates change (15). We used software from the National Cancer Registry for this analysis (<http://surveillance.cancer.gov/joinpoint/>). To determine the “best fit” model (number of joinpoints), we performed hypothesis tests between slopes of adjoining line segments. The number of segments was reduced until the slopes were significantly different. This resulted in the following best fit model describing two line segments with a single Joinpoint for each of the three indices of volunteerism:

$$Y = \beta_0 + \beta_1 X + \delta_1 (X - \tau_1)$$

where τ_1 is the Joinpoint.

Survey data analysis. We analyzed the results of the survey using descriptive statistics and logistic regression (3). For the regression model, we utilized the number of times a dentist volunteered with MTI in the past 12 months (≤ 1 or ≥ 2) as our index of volunteerism (dependent variable). We considered eight independent variables: current work situation (retired or not retired), age group, sex, practice specialty (general dentist or specialist), practice setting (private, corporate, or academic), dental school community dentistry experience, and responses to the two Likert-type questions about professional responsibility and religious faith as motivations for service. Responses to the professional responsibility question were dichotomized (ranked within the top three vs ranked 4 or greater), as were the responses to the religious faith question (ranked within the top four vs ranked 5 or greater). Using univariable logistic regression (Stata), we examined the relationships between volunteerism and each of the independent variables. We then built a model utilizing both the backward and forward stepwise methods (Stata). The p-value

for a variable to enter the model was set at 0.10 and the p-value to remove a variable was set at 0.20. The results of these two methods were the same.

Results

Phase 1: Focus groups. We conducted two focus groups comprised of stakeholders in the MTI Mobile Dental Program. The purpose of these groups was to gain information that could be used to guide the survey design.

Focus Group 1 was comprised of four MTI Mobile Dental Program staff members. In response to Question #1 regarding the importance of access to good dental care for low income individuals in Oregon, participants in this group raised several issues. The first had to do with a definition of “good dental care”, and the comment was made that a person of low income may have a different perception (or expectation) of what constitutes good dental care than does an individual of higher income. Another issue raised was that even when care is available, a lack of funds may effectively deny a low income person access to that care. Finally, participants agreed that before coming to work in the program, at least some of them had been somewhat oblivious to the great need that existed and thus to the importance of this as a public health problem in Oregon. However, working in the program has allowed them to see firsthand the high numbers of patients with severe dental caries and other oral health issues, thus raising their awareness of the needs in this state.

Question #2 asked about the factors that motivate dentists to volunteer their services to low income patients. Participants suggested that dentists’ reasons for volunteering are a mix of altruistic and self-serving motivations. During the discussion they listed learning

(professional development), teaching students, humanitarian reasons, guilt, compassion, broadening their professional skills and experiences, religious faith, giving back to the community, and a commitment to public health as reasons why the dentists they work with choose to volunteer.

Question #3 asked about barriers to volunteerism among Oregon dentists generally.

Participants listed a lack of time, a desire to earn money, a lack of awareness of volunteer opportunities, a lack of volunteer ethic among peers, a lack of emphasis on community dentistry in their dental education, and incorporation of some free care into their regular practices as reasons why dentists might choose to limit their volunteer service.

Question #4 addressed specific aspects of the MTI Mobile Dental Program that might prevent or limit volunteerism. Participants raised two major issues: a lack of state-of-the-art equipment and limited supplies of materials/pharmaceuticals, and a cumbersome recruitment process including extensive paperwork. Few clinic times available outside of regular working hours, requiring dentists to take time off from their regular practices to volunteer, were also thought to be a barrier for some.

As all of the potential barriers included in our original hypotheses were mentioned by group participants, Question #5 was omitted.

As they were discussing the focus group questions, participants spontaneously came up with several ideas for addressing the barriers they identified. They suggested a need to find win-win situations, such as a method for earning continuing education credits for volunteer service. More support from the Oregon Dental Association for public health ventures would be valuable. It may also be appropriate to schedule more clinics for

evening or weekend hours, so that professionals do not have to take time away from their regular practices to volunteer. Finally, new and more aggressive recruitment strategies may be necessary. Medical Teams International has intentionally maintained a “soft” recruitment policy organization-wide for their volunteers, relying on word of mouth to bring interested individuals to them. Although this strategy is working for the many volunteer positions in the organization filled by lay persons, as well as for the more visible international programs of the organization, it may not be sufficient to fill professional positions and staff a growing Mobile Dental Program.

Focus Group 2 was comprised of seven dentists who are either currently serving or have served previously in the Mobile Dental Program. In response to Question #1, they affirmed that a lack of access to good dental care for low-income individuals is “absolutely” an important public health problem in Oregon. They commented that there is a “huge unmet need” and “no good safety net” for these patients, and that there are “not enough places like Medical Teams International” where this population can receive care.

This group felt that factors motivating dentists to volunteer their services include opportunities to give back to their communities, to work with people, to help people, and to continue to use their professional skills after retirement.

The group identified a number of potential barriers to volunteerism by dentists. One participant pointed out that there are many general dentists who prefer not to work with children. (Nitrous oxide, commonly used to sedate children during dental procedures, is not available on the dental vans.) Some dentists who do not perform many extractions in their private practices are uncomfortable having to do so in the setting of the mobile

dental clinic. Other participants cited financial reasons for not volunteering, particularly for recent graduates who have high educational debt burdens. However, the comment was also made that the majority of dentists they know personally do not work more than four days per week in their private practices. Finally, one participant indicated that some retiring dentists may face complex and expensive licensure issues if they wish to serve in a volunteer capacity post-retirement.

A few potential barriers were identified that are specific to the MTI Mobile Dental Program. One participant who happens to be left-handed pointed out that the orientation of the equipment in the vans makes it difficult for practitioners who are left-handed. Also, the equipment on the vans is not state-of-the-art, and some of it may need to be updated. There may also be liability concerns, as some dentists are not covered by their own insurance outside of their regular practices.

This group was strongly supportive of the Mobile Dental Program, and in that spirit they also spontaneously identified many potential changes that could be made to address the barriers they identified. Early in the discussion, one participant noted that in other arenas he has found that it often takes many small changes rather than a single big change to be successful in addressing a problem. He suggested that addressing barriers to volunteerism may require a similar approach. One individual suggested that it would be nice to offer some sort of recognition, thank you gifts, or awards to volunteers. He stressed that these should not be things for which the organization had to expend funds, but perhaps donated restaurant gift cards, newspaper coverage, or tickets to local sporting events could be used. Another suggestion was to provide snacks for volunteers at the clinics, which may

last as long as 6 hours. It is likely that there are non-dental volunteers within MTI who would be happy to provide homemade treats for the dental volunteers.

Another theme that emerged involved a grassroots effort to recruit volunteers, with each current volunteer being encouraged to talk about the rewards of volunteering with colleagues, and to invite a colleague to accompany him or her to a mobile clinic.

Continuing education credits are available for dentists who volunteer with MTI; however this is not well-known and should be more widely publicized. Indeed, some participants felt that the Mobile Dental Program's work could be better publicized in local journals (such as that of the Oregon Dental Association), and suggested that MTI volunteers and staff might submit articles with topics such as "Advantages to the new practitioner of volunteering with MTI" or "Why I enjoy volunteering". Such articles could promote dental volunteerism generally, and could clarify some of the details of MTI service and address possible misconceptions among potential volunteers.

Participants suggested that MTI could work with instructors of oral surgery to offer a class in oral surgery techniques for those who wish to volunteer but are uncomfortable with doing extractions. MTI staff should also make it clear to potential volunteers that they do have a few volunteers who are oral surgeons, and thus there are occasional oral surgery clinics to which complicated cases can be referred. The group discussed the importance of getting exposure to community dentistry in dental school. OHSU dental students currently have the opportunity to work in the mobile dental clinics (with their advisor), and there is a waiting list for this class. However, currently they cannot receive OHSU credit for this work, and they must do it in their free time on Saturdays. It would

be advantageous to the students as well as to MTI if they could receive credit for the procedures they perform under their advisor’s supervision in the mobile dental clinics.

Finally, volunteer service may be particularly attractive to dentists as they move into retirement. Although the Oregon Dental Association does not track retirement information on its members, MTI should find ways to identify dentists who are retiring or close to retirement and send personal letters inviting them to consider becoming volunteers. One such source of practitioners nearing retirement might be dental school class reunions.

Descriptive statistics. We used several indices to quantify volunteerism in this study: number of dentists volunteering, total number of hours served, and number of clinics held, all expressed per year. We analyzed the data for all of Oregon (Table 1), as well as stratifying according to region (Portland, Salem, Roseburg, and Central Oregon).

The total numbers of dentists volunteering in the Mobile Dental Program statewide and in each of the four geographical regions from 2003 to 2012 are shown in Figure 3. In general, the number of volunteers grew in each of the geographic regions as well as statewide over the first part of the last decade. The Roseburg subprogram was begun in 2003, and the Central Oregon subprogram began

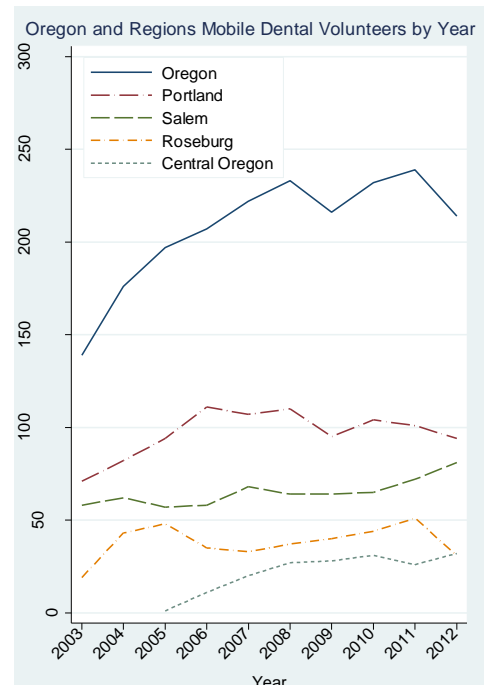


Figure 3. Total number of dentists volunteering in the Mobile Dental Program statewide and in each of the four geographical regions from 2003 to 2012.

in 2005. In general, the number of volunteers in a subprogram appears to reach a maximum about two to three years after it begins, and then remains relatively constant thereafter. Before 2002, the Portland subprogram operated with only one van. A second van was added in 2002, and a third van was added in 2004, thus allowing for more growth. Beyond 2006, the number of dentists volunteering in Portland remained relatively constant, although there was a slight drop from an average of 109 volunteers per year in 2006-2008 to an average of 99 volunteers per year in 2009-2012. After 2007, the total number of volunteers in all of the regions combined also remained relatively stable. Similar patterns are seen for the number of hours served (Figure 4), as well as for the number of clinics held (Figure 5).

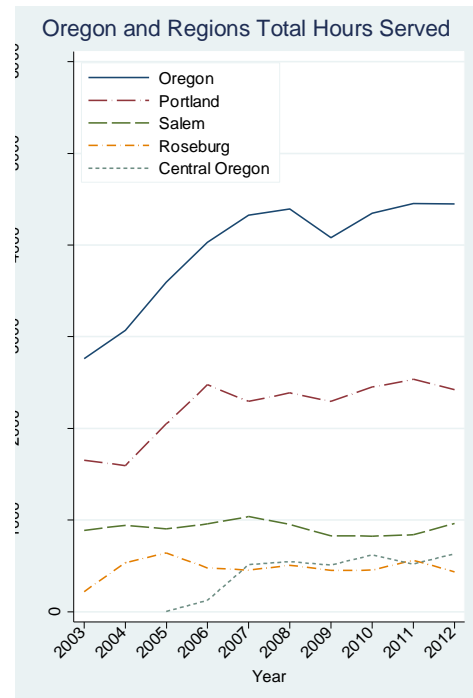


Figure 4. Total number of volunteer hours served by dentists in the Mobile Dental Program statewide and in each of the four geographical regions from 2003 to 2012.

Although we did not see a large fall in any of these indices of volunteerism over the past several years, it is apparent from the shape of the curves that the *rate of growth* of the program statewide has declined. We calculated the fractional change in these indices by year to quantify the growth of the program, and calculated best fit regression lines for the relationships between each of the indices and time in years. (Fractional change = [Number of volunteers in that year – Number of volunteers in previous year]/Number of volunteers in previous year.) Figure 6 shows that the fractional change in number of volunteers (“growth”) was positive but falling until 2009-2010, and then averaged below

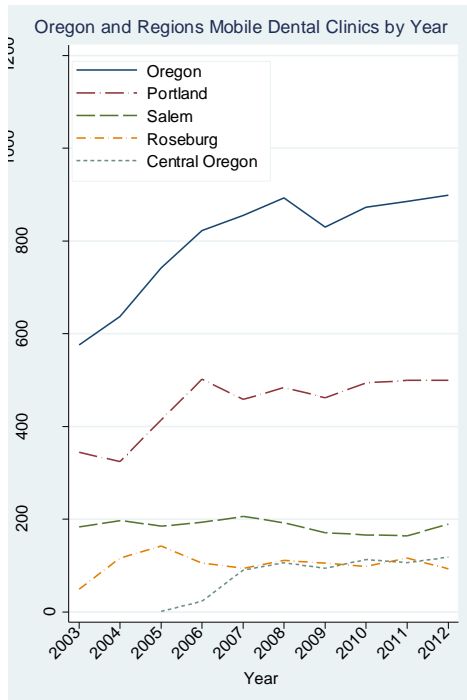


Figure 5. Total number of clinics staffed by volunteer dentists in the Mobile Dental Program statewide and in each of the four geographical regions from 2003 to 2012.

declining by 1.9 percentage points per year, and that of number of clinics declining by 1.7 percentage points per year. Thus, by these measures volunteerism increased during the first half of the last decade and growth of the program was positive, whereas volunteerism remained relatively constant during the second half of the

zero for the period from 2010 through 2012.

Overall growth was as high as 27%/yr between 2003 and 2004, and as low as -10%/yr between 2011 and 2012. Importantly, there was a consistent negative relationship with time ($p=0.012$), with an average decline in growth of three percentage points per year. Thus, the program experienced rapid growth, then slower growth, and finally little to no growth, and on average a slight shrinking of activity. Similar patterns were seen for number of hours served and number of clinics held (Figures 7 and 8), with growth of the number of hours served

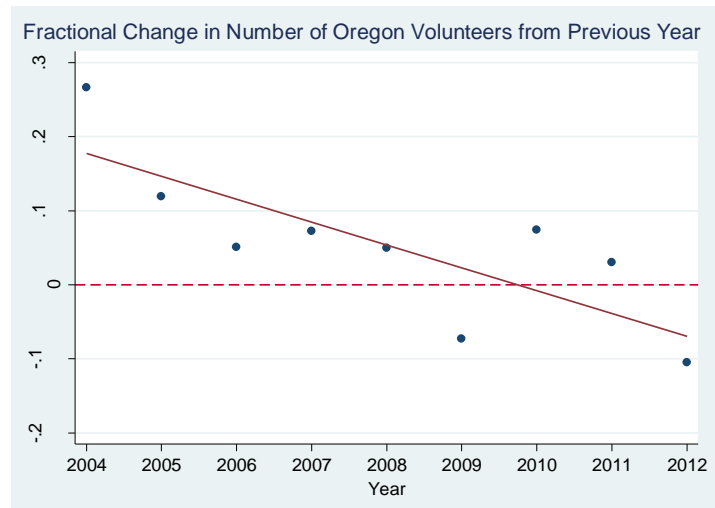


Figure 6. Growth of Oregon Mobile Dental Program measured by number of volunteers. Fractional change is calculated as the number of volunteers in the year in question minus the number of volunteers in the previous year, divided by the number of volunteers in the previous year. The equation for the regression line is: fractional change in volunteers = $61.947 - 0.0308 \cdot \text{year}$. $Y=0$ at 2009.7 yrs.

decade and growth was essentially zero.

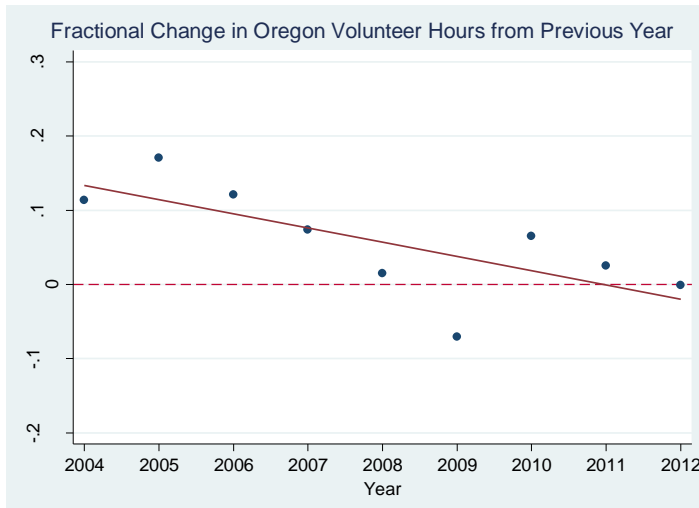


Figure 7. Growth of Oregon Mobile Dental Program measured by number of hours volunteered. The equation for the regression line is: Fractional change in hrs = 38.533 – 0.0192* year. Y=0 at 2011.0 yrs.

To further assess growth in more detail, we used Joinpoint regression methods to analyze monthly data. Due to cyclical seasonal variations in program activity, the monthly data were quite variable. However, the large number of data points provided by the monthly data

allowed us to utilize these Joinpoint techniques most effectively. Figures 9-11 show the results of these analyses. For all three variables, the best-fit model was that which utilized a single joinpoint. According to the fitted model, the number of volunteers serving monthly statewide increased by 0.44 volunteers/month from January 2003 to approximately February 2006 (p=0.0006), at which point growth essentially ceased, and the total volunteer number remained constant (p=0.66) thereafter (Figure 9). Using this method, we can say with 95% confidence that the transition point fell between October 2004 and August 2008. Similar trends are apparent for volunteer hours and number of clinics (Figures 10 and 11). The number of hours served monthly increased by 2.75 hrs/month from January 2003 to approximately March 2007 (p<0.000001) and did not change significantly thereafter (p=0.54). The 95% confidence interval for this Joinpoint was September 2005 – June 2008. The number of clinics held monthly increased by 0.61 clinics/month from January 2003 to approximately May 2006 (p=0.000008), and did not

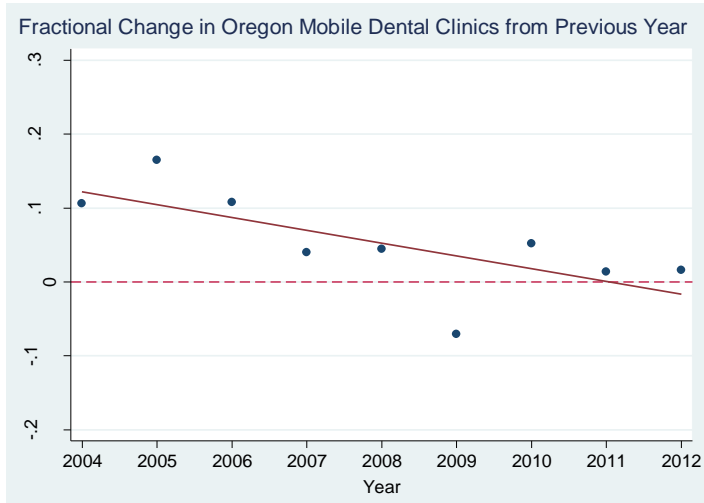


Figure 8. Growth of Oregon Mobile Dental Program measured by number of clinics held. The equation for the regression line is: Fractional change in clinics = 34.735 - 0.0173*year. Y=0 at 2011.1 yrs.

change significantly thereafter (p=0.14), with a 95% confidence interval of July 2005 – July 2008 for this Joinpoint. Thus, for all three indices, significant growth occurred in the first part of the decade but then growth essentially ceased. Taken together, the data suggest that the transition point occurred

between September 2005 and June 2008.

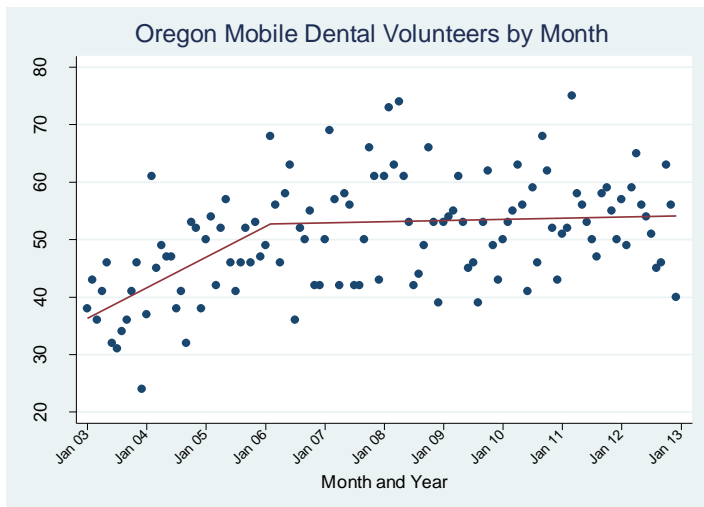


Figure 9. Number of Mobile Dental volunteers by month with Joinpoint regression lines. The slope of the first line is estimated to be 0.44 (p=0.0006) and the slope of the second line is estimated to be 0.02 (p=0.66). The estimated Joinpoint falls at month = 38 (Feb 06), with the 95% CI = 22-68 months (Oct 04 – Aug 08).

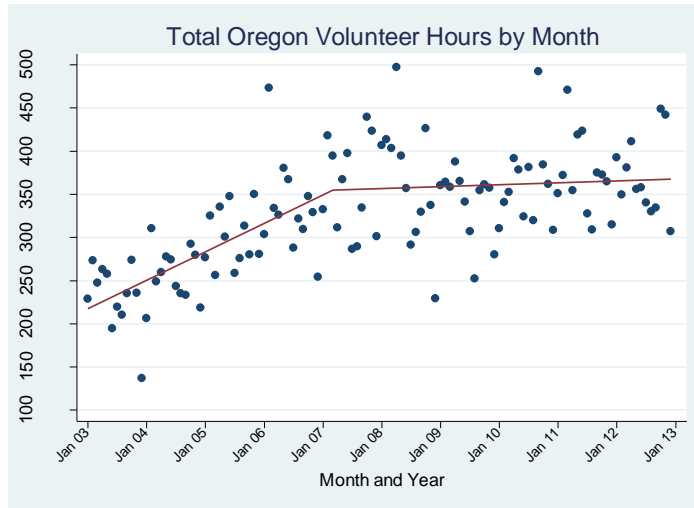


Figure 10. Number of total volunteer hours by month with Joinpoint regression lines. The slope of the first line is estimated to be 2.75 ($p < 0.000001$) and the slope of the second line is estimated to be 0.18 ($p = 0.54$). The estimated Joinpoint falls at month = 51 (Mar 07), with the 95% CI = 33-66 months (Sep 05 – Jun 08).

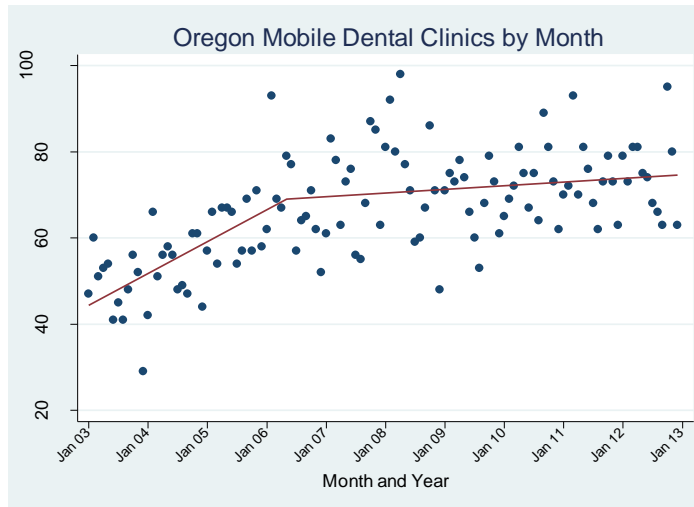


Figure 11. Number of Mobile Dental clinics by month with Joinpoint regression lines. The slope of the first line is estimated to be 0.61 ($p = 0.000008$) and the slope of the second line is estimated to be 0.07 ($p = 0.14$). The estimated Joinpoint falls at month = 41 (May 06), with the 95% CI = 31-67 months (Jul 05 – Jul 08).

Table 1. Volunteer data by year for Oregon.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
# of Clinics	576	637	742	822	855	893	830	873	885	899
# of Volunteers	139	176	197	207	222	233	216	232	239	214
# of Volunteer Hours	2758	3071	3595	4030	4326	4391	4080	4346	4454	4450
# of 1-Time Volunteers (%)	51(36.7)	70(39.8)	84(42.6)	83(40.1)	96(43.2)	106(45.5)	90(41.7)	110(47.4)	116(48.5)	93(43.5)
# of 1-Timers Returning (%)	28(54.9)	30(42.9)	40(47.6)	40(48.2)	39(40.6)	50(47.2)	45(50.0)	50(45.5)	44(37.9)	N/A

Number of Clinics Attended by Individual Volunteers - 2012

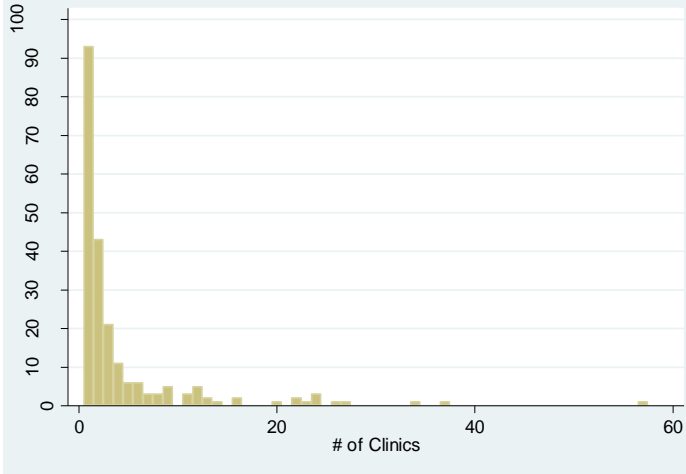


Figure 12. Distribution of Oregon volunteer dentists according to the number of clinics in which they served in 2012.

We also examined the patterns of volunteerism among individual dentists, particularly the number of clinics they attended and whether they served one time or more often. The distribution of volunteer dentists according to the number of clinics in which they served is shown for 2012 in

Figure 12. (A “clinic” is one, single-day event, usually lasting about five hours.) It is apparent that this distribution is highly skewed: out of a total of 214 total volunteers, 93 (43%) served in only one clinic during that year. Half of the 899 total clinics were covered by only 23 (11%) of the total volunteer pool, and 20% of the total clinics were covered by five dentists. Six dentists volunteered two or more times per month, and 20 volunteered at least once per month in 2012. The findings were similar for each year studied (2003-2012) (graphs not shown). As summarized in Figure 13, between 2003 and 2012 the fraction of dentists who volunteered only once in a given year ranged between 35% and 50%, and this fraction generally increased over time (approximately 0.93%/yr). Thus, the bulk of the volunteer work burden in this program is borne by a relatively few individuals, and this skewing of responsibility is becoming more pronounced.

We further examined the volunteer patterns of the large group of volunteers who served only one time in a given year. Figure 14 shows that the proportion of these individuals who returned to volunteer the following year averaged slightly less than 50%, and remained relatively constant over time

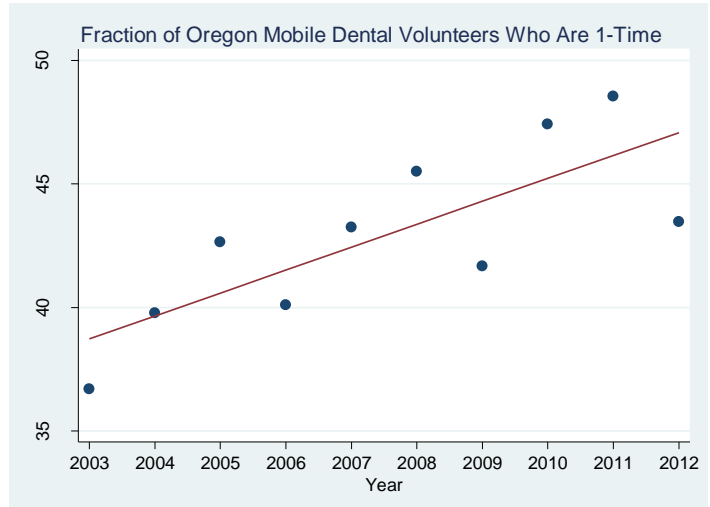


Figure 13. Fraction of the total number of Oregon volunteers for each year who served only one time that year. The equation for the fitted regression line is $\text{Fraction} = -1819.5 + 0.9277 \cdot \text{year}$. The slope of this line is significantly greater than zero ($p=0.008$).

($p=0.17$). This further supports the idea that there are a relatively large number of volunteers who bear only a very small part of the workload. One fourth of all those who volunteer do so only once and do not return.

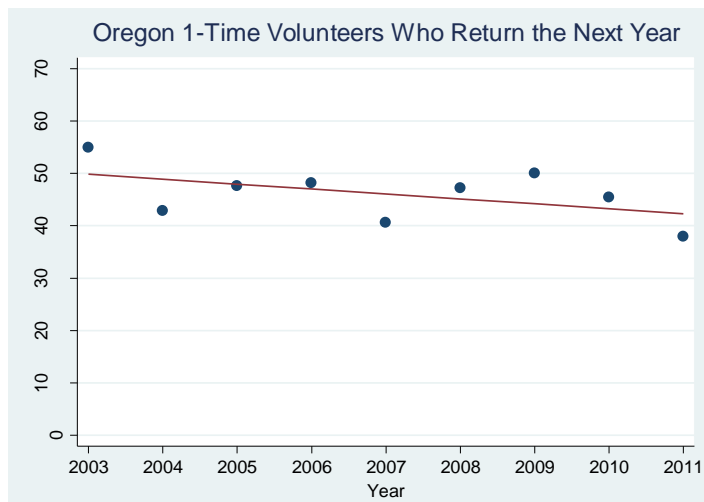


Figure 14. Fraction of one-time volunteers (those serving only once in a year) who return to volunteer the next year. The equation for the fitted regression line is $\text{Fraction} = 1931.7 - 0.940 \cdot \text{year}$. The slope of this line is not significantly different from zero ($p=0.17$).

Very little information was available in the database regarding clinic patients in the Mobile Dental Program. However, Figure 15 shows that, between 2007 and 2012 (the years for which data were available), more than twice as many adults as children were seen in these clinics. The

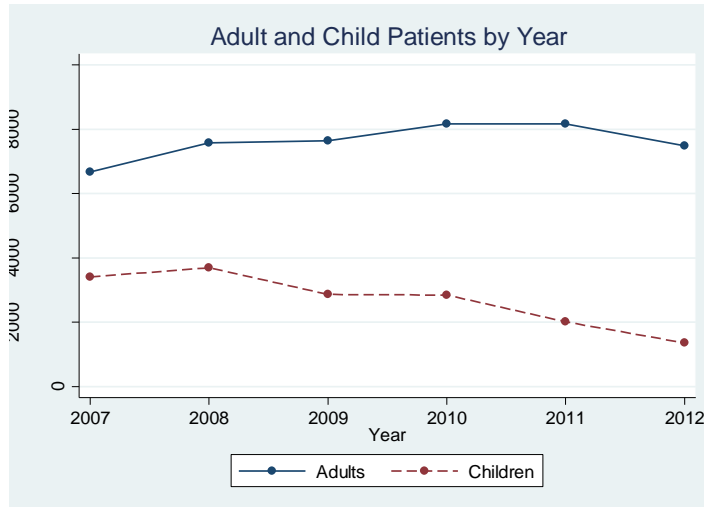


Figure 15. Number of adult and child (<18 yrs) patients seen statewide in clinics of the Mobile Dental Program from 2007 to 2012.

number of adult patients has tended to rise slightly over this time, whereas the number of patients under age 18 has fallen significantly. Thus, the fraction of patients who are under 18 has decreased from 34% to 15% over the past five years ($p < 0.001$) (Figure 16).

In summary, all three measures of volunteerism in this program (number of volunteers, number of hours served, and number of clinics held) indicate that volunteering increased between 2003 and 2006, particularly as new regional subprograms were added. After 2007, the total number of volunteers, hours served, and clinics held in all of the regions combined have remained relatively stable. Thus, the growth rate of the program has been essentially zero for the past five years. The bulk of the work burden is borne by relatively few individuals. Almost half of the total volunteers serve only once in a year, and about half of those do not return the following year. The proportion of patients who are under 18 has

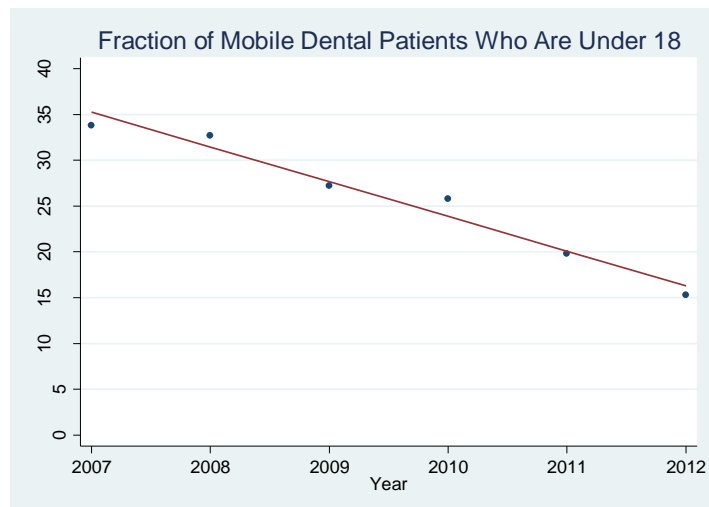


Figure 16. Fraction of Oregon Mobile Dental Program patients who were under 18 years of age. The equation for the fitted regression line is $Pctchildren = 7638.9 - 3.789 * year$. The slope of this line is significantly less than zero ($p < 0.001$).

decreased from 34% to 15% over the past five years.

Survey results. A total of 699 dentists have volunteered in the MTI Mobile Dental Program over the past ten years. Of these, at least 3 are now deceased. We had e-mail addresses for 579 volunteer dentists. We attempted to contact the remainder by telephone to get current e-mail addresses, however, many offices refused to give out this information. Therefore, we sent the letter of invitation to participate in the survey to 620 current or former volunteer dentists. For many of these, we had both office and personal e-mail addresses, and we sent the invitation to both addresses. Of the e-mails we sent, 90 came back as undeliverable. We thus assume that 530 were delivered. We received a total of 117 responses to the survey, which yields a response rate of 22.1%.

Descriptive statistics. The descriptive statistics of survey respondents are shown in Table 2. The respondents represented all four regions of Oregon and one third had not served in the program within the past year. They represented general dentistry and several specialties. Over half are

currently employed full time, and less than 10% are retired.

Motivations for volunteer service. The priorities with which respondents ranked their motivations for volunteer service are summarized in Figure 17. The strongest

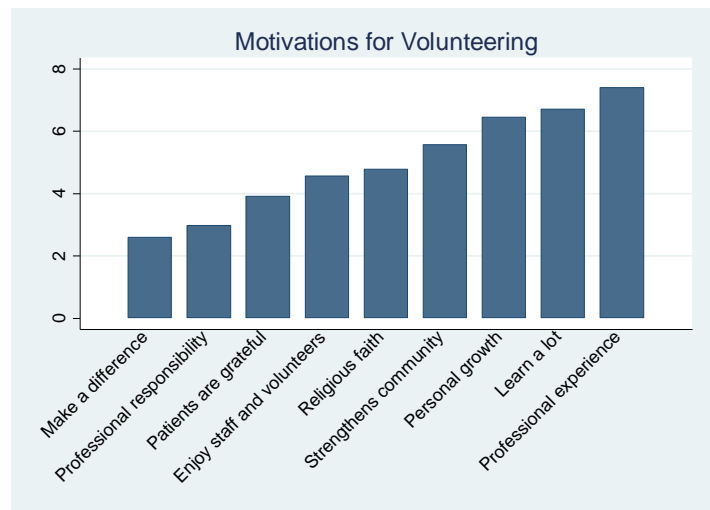


Figure 17. Factors motivating dentists to volunteer, ranked on a scale of 1-9 with 1 being the most important.

Table 2. Descriptive statistics of survey respondents.

	Count	Mean(SD)	Median	Skipped question
n	117			
Sex (M/F)	94/22 (81.0/19.0%)			1
Age (yrs)		52.6(13.5)	54.5	2
Time served (yrs)		6.7(5.9)	5	1
Region				9
Portland	55(50.9%)			
Salem	36(33.3%)			
Roseburg	8(7.4%)			
Central Oregon	9(8.3%)			
# times served in last 12 months				
0	40(34.2%)			
1	19(16.2%)			
2-5	34(29.1%)			
6-23	21(17.9%)			
24 or more	3(2.6%)			
# yrs since volunteering		3.3(3.0)	2	
Time since graduation from dental school (yrs)		23.9(13.8)	25	
Practice type				2
General dental practitioner	97(84.3%)			
Dental specialist	18(15.7%)			
Pediatric dentistry	7(6.1%)			
Public health and education	2(1.7%)			
Endodontics	1(0.9%)			
Periodontics	2(1.7%)			
Oral surgery	3(2.6%)			
Orthodontics	1(0.9%)			
Prosthodontics	1(0.9%)			
Other	1(0.9%)			
Practice setting				1
Private	102(87.9%)			
Corporate	9(7.8%)			
Academic	5(4.3%)			
Current work situation				
Employed full time (≥ 4 d/wk)	68(58.1%)			
Employed part time (< 4 d/wk)	35(29.9%)			
Retired	11(9.4%)			
Other	3(2.6%)			

motivations were feelings of “making a difference in the lives of some of these patients” and a sense of professional responsibility. Personal benefits such as promoting self esteem, learning a lot, and added professional experience were ranked as least important motivators. No respondent ranked self esteem or learning as his or her number one choice. Thirty-nine percent ranked a religious faith motivation as one of their top three choices, whereas 21% ranked this factor last.

Barriers to volunteer service with MTI. The priorities with which respondents ranked barriers to their volunteer service are summarized in Figure 18. The biggest barrier to volunteering was that these

dentists also volunteer elsewhere, with this being ranked the number one barrier by 48.8% of respondents. Cramped facilities and/or outdated equipment were ranked #2, and a preference for working only with patients of a particular age was ranked #3 as a barrier.

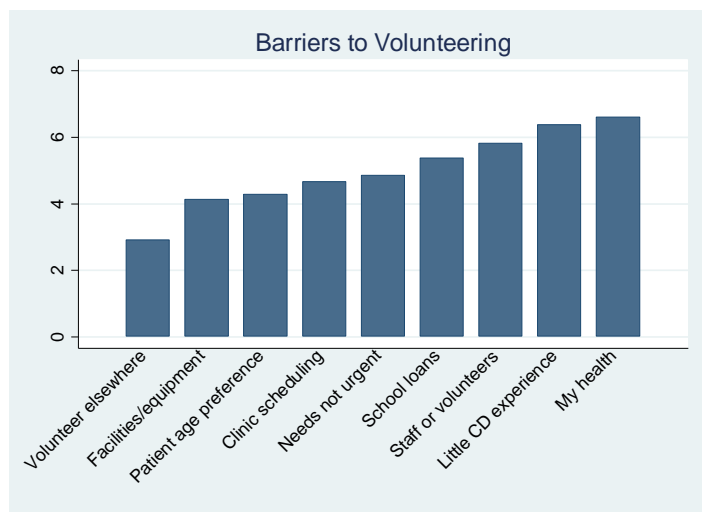


Figure 18. Factors that limit or prevent dentists from volunteering, ranked from 1-9 with 1 being the most important.

Responses to Likert-type questions about barriers to volunteerism. Our survey used 12 Likert-type questions (and follow-up questions if responses indicated agreement or strong agreement) to assess the importance of individual limiting factors. The results are summarized in Tables 3 and 4 and also shown in Figures 19 and 20. The responses of dentists to the statement that their volunteer service is limited by their participation in

other programs are shown in Figure 19A. Ten percent of respondents indicated that they strongly agreed with this statement, and another 14% said that they agreed with it. Thus, although volunteering elsewhere was ranked on average as the #1 barrier to volunteerism, only about one fourth of all respondents indicated that it significantly limited their volunteering with MTI. Respondents who indicated agreement listed the following as the other venues in which they participate: Oregon Mission of Mercy (7), Boys and Girls Club (6), free care in their own office (5), Compassion Connect clinics (4), Linn-Benton Community College (3), Donated Dental Services (3), White Bird clinic (2), Creston School clinic (2), Tooth Taxi (2), and international trips (2), as well as others in which only one respondent participated. The main factors that made these other venues attractive to respondents were ease and comfort of working in their own office, teaching opportunities, agreement with the goals and values of the organization (B&G Club), Oregon Dental Association sponsorship (OrMOM), strengthening the local community, convenient location, and more control over choice of patients with urgent/emergent needs.

The responses of dentists to the statement that their volunteer service is limited by the facilities are shown in Figure 19B. Only 8% agreed with this statement, and only 2.7% strongly agreed. Thus, although facilities were ranked on average as the #2 barrier to volunteerism, less than 11% of respondents indicated that it significantly limited their volunteering. These respondents listed several concerns with serving in the vans, including uncomfortable (cramped) conditions, inefficiency, outdated or broken equipment, proximity to x-ray equipment, lack of privacy for patients, and inconvenient conditions for left-handed dentists.

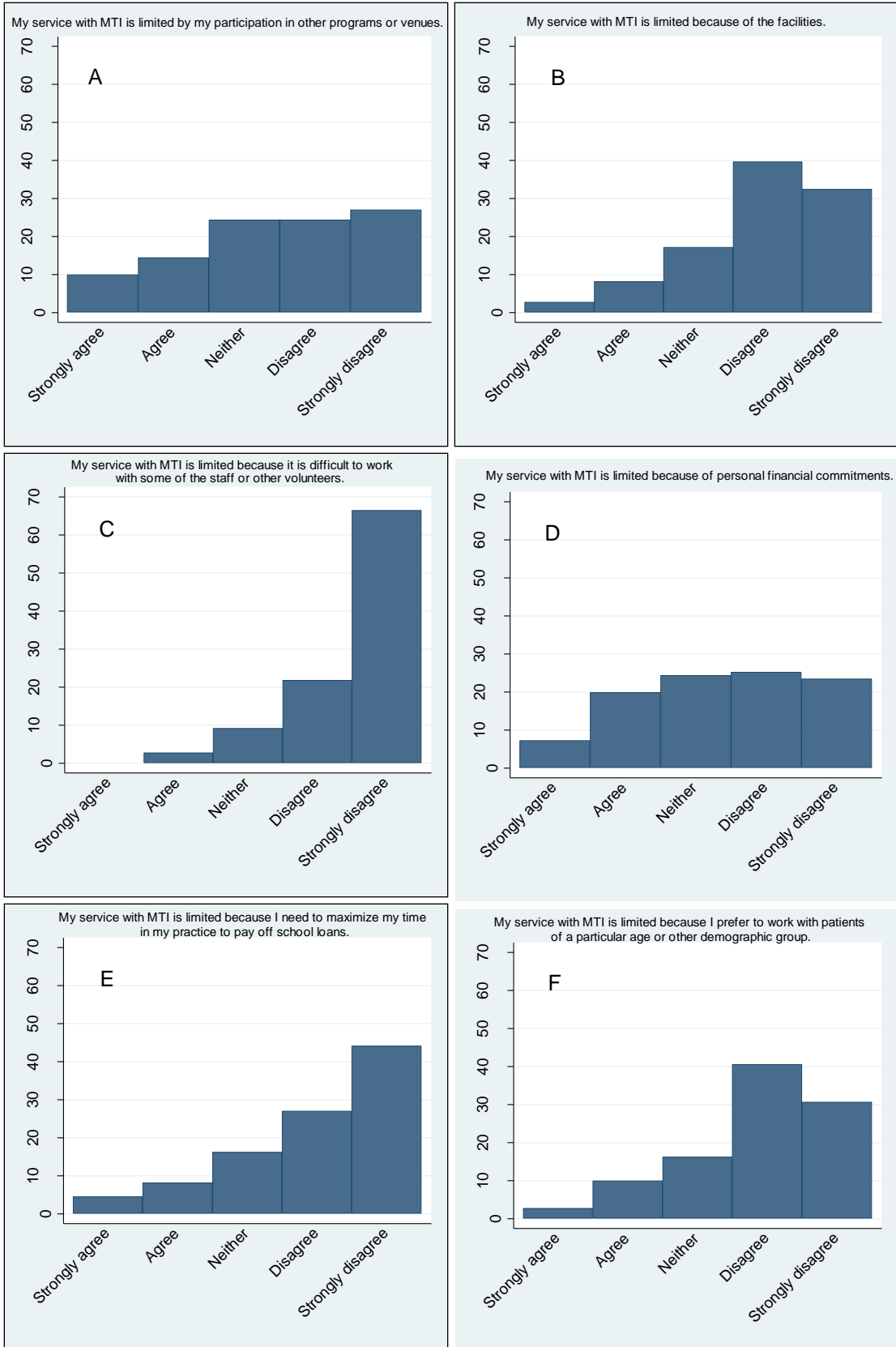


Figure 19. Responses of volunteer dentists to Likert-type questions.

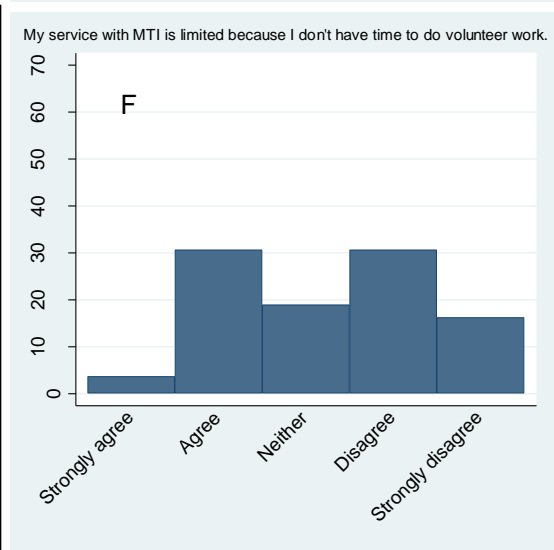
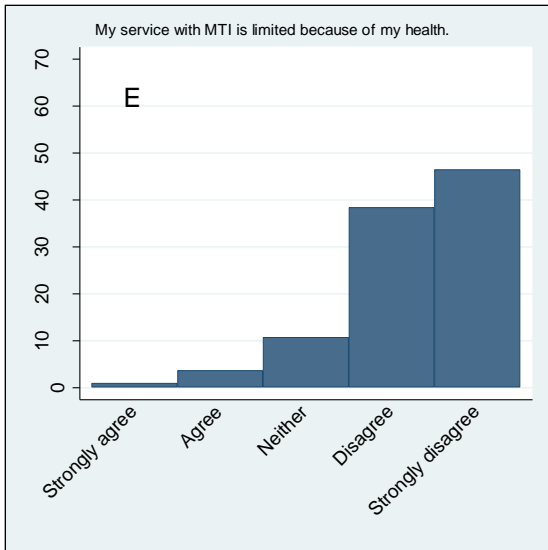
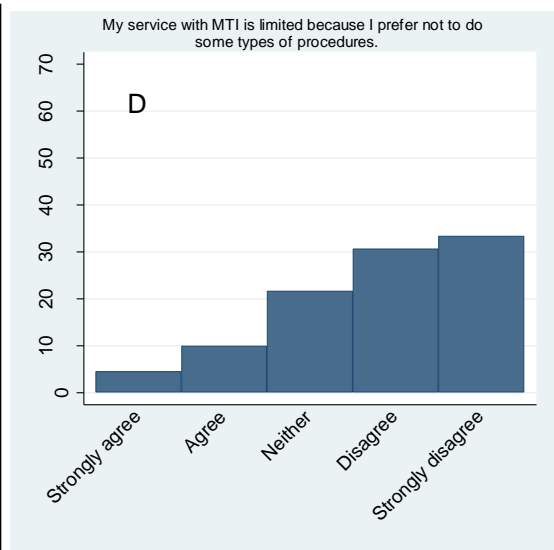
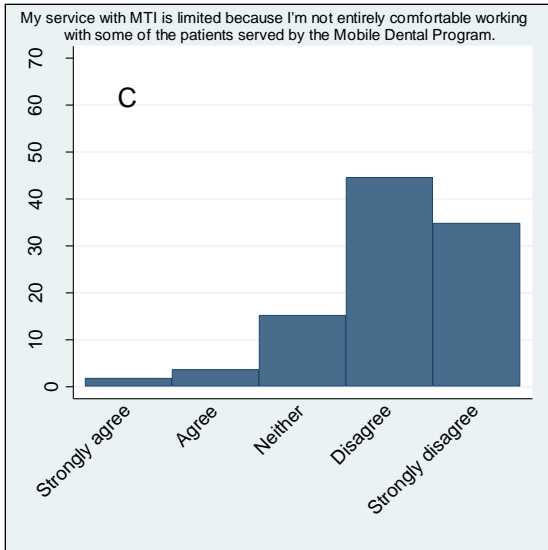
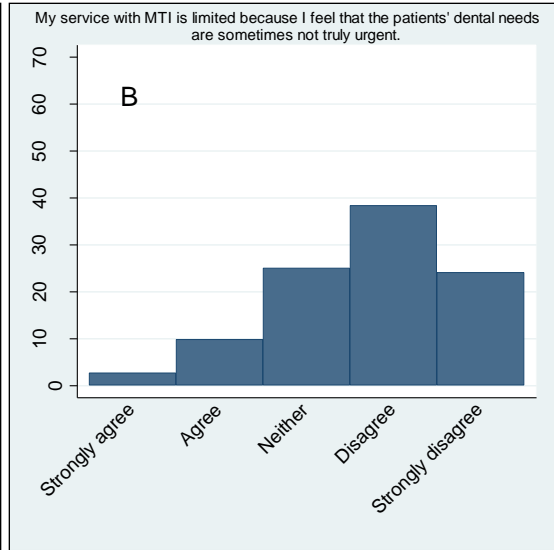
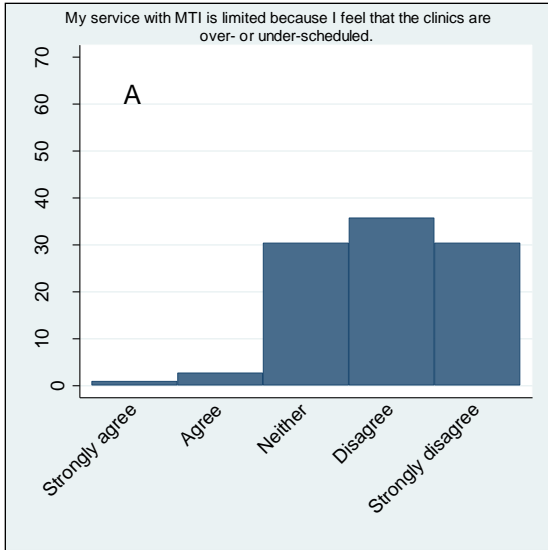


Figure 20. Responses of volunteer dentists to additional Likert-type questions.

The responses of dentists to the statement that their volunteer service is limited because it is difficult to work with some of the staff or other volunteers are shown in Figure 19C.

Only 2.7% of respondents agreed with this statement, and no respondent “strongly agreed”. Indeed, 66.4% indicated strong disagreement with this statement. Of those who agreed, one indicated a desire to have more choice over the team with which s/he works, one indicated a concern that a van manager would voice disagreement with a dentist’s choice of treatment for a patient, and one was concerned that triage was ineffective or inefficient.

The responses of dentists to the statement that their volunteer service is limited because of personal financial commitments are shown in Figure 19D. Twenty-seven percent of respondents indicated either agreement or strong agreement with this statement, and the remaining 73% were approximately evenly divided among “neither agree nor disagree”, “disagree”, and “strongly disagree”. The responses of dentists to the related statement that their volunteer service is limited because of a need to maximize time in their practices to pay off school loans are shown in Figure 19E. Thirteen percent indicated either agreement or strong agreement with this statement, 27% disagreed and 44% strongly disagreed. Only 14.6% of respondents indicated that they still have outstanding school loans. Thus, school loans can only account for the personal financial commitments that limit volunteerism in about half of respondents who indicated that finances were a significant barrier.

The responses of dentists to the statement that their volunteer service is limited because of a preference for working with patients of a particular age or other demographic group

are shown in Figure 19F. Two point seven percent of respondents indicated strong agreement with this statement, and 9.9% indicated agreement. Of the 14 who indicated a preference, 5 preferred adults, 4 preferred children, 1 preferred Hispanic (Spanish-speaking) patients, 1 preferred U.S. citizens, and 4 indicated a preference for patients who are truly needy. These respondents also indicated preferences not to work with children (7), undocumented individuals (2), those who they believe are not truly indigent or otherwise abuse the system, those who are ungrateful (1), and those who are incarcerated (1). There was a concern among some volunteers that they see some patients who could pay but who choose to spend their resources in other ways, and that some patients have non-urgent needs or want free cosmetic services.

The responses of dentists to the statement that their volunteer service is limited because the clinics are over- or under-scheduled are shown in Figure 20A. Less than 4% indicated that they either strongly agreed or agreed with this statement. Clinic scheduling is done by the partner organizations, and thus varies from one partner to another. The responses of dentists to the related statement that their volunteer service is limited because of a feeling that patients' dental needs are sometimes not truly urgent are shown in Figure 20B. More dentists were concerned about this partner issue than about the scheduling issues. Nearly 13% either strongly agreed or agreed with this statement. In the free comment follow-up question for this section, several concerns were noted. Two specific partner organizations were cited as having scheduling problems. Several respondents indicated concerns about non-urgent needs, as well as abuse of the system by patients who should be able to pay for dental care.

The responses of dentists to the statement that their volunteer service is limited because they are not entirely comfortable working with some of the patients served by the Mobile Dental Program are shown in Figure 20C. Only 5.4% of respondents indicated strong agreement or agreement that this was a barrier to their volunteer service whereas 79.4% indicated disagreement or strong disagreement. Of those indicating that this was a barrier, half agreed that additional educational experience in community dentistry would increase their comfort level with and ability to serve MTI Mobile Dental Program patients, whereas half disagreed or strongly disagreed with this statement.

Three questions addressed the community dentistry experiences of respondents during dental school. When asked to describe the character of their dental school community dentistry experiences, 46.1% indicated that they had non-operating experiences (screening, health education) in their freshman and sophomore years, 40.2% had non-operating experiences in their junior and senior years, 67.6% had clinical operating experiences in their junior year, and 79.4% had clinical operating experiences in their senior year. When asked to describe the average amount of time they spent on community dentistry experiences in dental school, 21.8% indicated 1 day or less per year, 29.1% indicated 2-5 days per year, 23.6% indicated 6-9 days per year, and 25.5% indicated 10 or more days per year. When asked whether they volunteered in community dentistry clinics beyond regularly scheduled programs (for instance Saturday mornings), 38.4% indicated that they did so.

The responses of dentists to the statement that their volunteer service is limited because they prefer not to do some types of procedures are shown in Figure 20D. Approximately 14% of respondents indicated strong agreement or agreement with this statement. Of

these, 29.4% preferred not to do restorations, 35.3% preferred not to do extractions, and 2 individuals indicated that they are uncomfortable doing procedures in the mobile dental vans that they might be comfortable doing in their offices.

The responses of dentists to the statement that their volunteer service is limited because of their health are shown in Figure 20E. Only 4.5% of respondents indicated that they strongly agreed or agreed with this statement.

The responses of dentists to the statement that their volunteer service is limited because they don't have time to do volunteer work are shown in Figure 20F. Only 3.6% of respondents strongly agreed with this statement, but 30.6% agreed whereas an equal percentage (30.6%) disagreed. In the free comment follow-up question for this section, respondents gave many factors that they felt significantly limited their volunteer participation: family obligations and children (15), busyness and lack of time (6), current short-term factors with intent to serve more in the future (4), professional costs for retirees (license, CE, insurance) (3), self-admitted "no good excuse" (3), living out of state (3), financial obligations (3), scheduling complications (3), preference for doing free care in his/her own office (2), hobbies (2), a need to rest from demanding fulltime work (2), patients not grateful (2), a desire to volunteer outside of dentistry (2), lack of personal stamina/ poor health (2), lack of respect for volunteers' time by MTI or partners (2), don't want to serve with a faith-based organization (2), just need to be asked more (2), lack of community dentistry skills (2), inefficiency of working with volunteer assistants (1), need for more illumination and magnification on vans (1), need to arrange childcare to volunteer (1), some patients have non-urgent needs (1). Many of these reiterated responses to previous questions, but a few raised new issues that should be considered. In

particular, three respondents raised the issue of professional costs for retirees. As only 11 respondents indicated that they were retired, this appears to be a barrier for 27% of retired dentists.

Table 3. Responses of volunteer dentists to Likert-type questions.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Average rating
My service with MTI is limited by my participation in other programs or venues (e.g. OrMOM, Compassion Clinics) in which I volunteer or provide free care.	9.9% (11)	14.4% (16)	24.3% (27)	24.3% (27)	27.0% (30)	3.44
My service with MTI is limited because of the facilities.	2.7% (3)	8.1% (9)	17.1% (19)	39.6% (44)	32.4% (36)	3.91
My service with MTI is limited because it is difficult to work with some of the staff or other volunteers.	0.0% (0)	2.7% (3)	9.1% (10)	21.8% (24)	66.4% (73)	4.52
My service with MTI is limited because of personal financial commitments.	7.2% (8)	19.8% (22)	24.3% (27)	25.2% (28)	23.4% (26)	3.38
My service with MTI is limited because I need to maximize my time in my practice to pay off school loans.	4.5% (5)	8.1% (9)	16.2% (18)	27.0% (30)	44.1% (49)	3.98
My service with MTI is limited because I prefer to work with patients of a particular age or other demographic group.	2.7% (3)	9.9% (11)	16.2% (18)	40.5% (45)	30.6% (34)	3.86
My service with MTI is limited because I feel that the clinics are over- or under-scheduled.	0.9% (1)	2.7% (3)	30.4% (34)	35.7% (40)	30.4% (34)	3.92
My service with MTI is limited because I feel that the patients' dental needs are sometimes not truly urgent.	2.7% (3)	9.8% (11)	25.0% (28)	38.4% (43)	24.1% (27)	3.71

My service with MTI is limited because I'm not entirely comfortable working with some of the patients served by the Mobile Dental Program.	1.8% (2)	3.6% (4)	15.2% (17)	44.6% (50)	34.8% (39)	4.07
Additional educational experience in community dentistry would increase my comfort level with and ability to serve MTI Mobile Dental Program patients.	0.0% (0)	50.0% (3)	0.0% (0)	33.3% (2)	16.7% (1)	3.17
My service with MTI is limited because I prefer not to do some types of procedures.	4.5% (5)	9.9% (11)	21.6% (24)	30.6% (34)	33.3% (37)	3.78
My service with MTI is limited because of my health.	0.9% (1)	3.6% (4)	10.7% (12)	38.4% (43)	46.4% (52)	4.26
My service with MTI is limited because I don't have time to do volunteer work.	3.6% (4)	30.6% (34)	18.9% (21)	30.6% (34)	16.2% (18)	3.25

Table 4. Fraction of respondents indicating that factor limited their volunteerism.

Factor	% indicating "strongly agree" or "agree"
Don't have time	34.2
Personal financial commitments	27.0
Alternate programs	24.3
Prefer not to do some procedures	14.4
Need to pay off school loans	12.6
Patient age or other demographics	12.6
Patient needs not urgent	12.5
Facilities	10.8
Uncomfortable with some patients	5.4
Health	4.5
Scheduling issues	3.6
Personnel	2.7

The responses of dentists to the question, “Which of the following are things we could do to improve your volunteer experience with the Mobile Dental Program?” are shown in Table 5. Respondents were encouraged to choose all options that applied. The option they

chose most often was to work with partner organizations to improve clinic scheduling and triage. There was also considerable interest in offering a class in oral surgery for volunteer dentists, with approximately one third of respondents choosing this option. Development of a loan repayment program was also of interest. Other ideas suggested by respondents included improving communication between MTI staff and volunteers, providing malpractice insurance coverage for retired volunteers, and considering expansion of the number of clinic locations or regions.

Logistic regression model of survey data. We developed a model of volunteerism using logistic regression and data from the survey. We utilized the number of times a dentist volunteered with MTI in the past 12 months (≤ 1 or ≥ 2) as our index of volunteerism

Table 5. Responses to the question, "Which of the following are things we could do to improve your volunteer experience with the Mobile Dental Program? (Check all that apply.)"

Option	Number (%) selecting
Provide a seminar or other type of background information/training on community dentistry (cross-cultural issues or working with indigent patients).	15 (15.8)
Work with partner organizations to improve clinic scheduling, ensure that patients have urgent needs, and help clinics to flow more smoothly.	39 (41.1)
Work to develop some type of loan repayment program for volunteers to help with educational debt.	28 (29.5)
Update the equipment on the vans so it is more like what I use in my dental office.	13 (13.7)
Hold more clinics during evening or weekend hours.	24 (25.3)
Offer a class in oral surgery for volunteer dentists.	31 (32.6)
Provide thank you gifts or awards for volunteers who serve frequently.	9 (9.5)
Other	
Provide digital radiography	1
Provide opportunities to do preventative education	1
Provide malpractice coverage for retired volunteers	2
Improve communication between MTI staff and providers (phone calls)	4
Inform dentists about clinical expectations	1
Consider expanding locations	2
Give more lead time when scheduling	1
Increase number of clinics at COCC	1
Provide snacks and coffee on vans	1
Emphasize spiritual focus	1
Provide CE credit for seminars	1

(dependent variable). We chose this particular breakpoint based on the knowledge that individuals who volunteer only once in a year often do so through large events in which MTI is a participant, and are not choosing to volunteer with MTI *per se*. They thus have not made a commitment to the MTI program as those volunteering at least two times in a year have done, and from this perspective they are more like the dentists who did not volunteer at all than they are like those who served at least twice. Also, dichotomizing with this breakpoint gave us essentially equal numbers in each outcome group (59 in the 0-1 time group and 58 in the ≥ 2 times group). We considered eight independent variables

(Table 6) as possible predictors of volunteerism: current work situation (not retired or retired), age group, sex, practice specialty (specialist or general dentist), practice setting (private, corporate or academic), dental school community dentistry experience (≤ 1 , 2-5, 6-9, or ≥ 10 days/yr), and responses to the two Likert-type questions about professional responsibility and religious faith as motivations for service. These variables were categorized as shown in Table 6. We used contingency tables and univariable logistic regression to check cell size (adjusting groupings as appropriate) and individual p values (Table 7). We then utilized both the backward and forward stepwise methods to build our model – both techniques yielded the same results. There was no strong evidence of interaction between any variables. The final model included only current work situation and faith group as significant contributors to volunteerism (Table 8). Pseudo R^2 was 0.099. (Pseudo R^2 for the full model was 0.165.) The odds ratio for current work situation was 6.59 ($p=0.025$) and the odds ratio for faith group was 3.51 ($p=0.004$).

Table 6. Variables considered for logistic regression model of survey data.

Variable description	Variable name	n in group
# times volunteered in past year	timescore (dependent variable)	
0 0-1 time		59
1 ≥2 times		58
Current work situation	fulltimegrp	
1 not retired		106
2 retired		11
Age group 2	agegrp2	
1 ≤35		17
2 36-45		23
3 46-55		18
4 56-65		39
5 >65		17
Sex	sex	
1 female		22
2 male		94
Practice specialty	practice	
0 specialist		18
1 general dentist		97
Setting	setting	
1 private		102
2 corporate or academic		14
Dental school community dentistry time	dentschcd	
1 ≤ 1 day/yr		24
2 2-5 days/yr		32
3 6-9 days/yr		26
4 ≥ 10 days/yr		28
Professional responsibility	profrespgrp	
1 prof resp ranked 1-3		71
2 prof resp ranked 4-9		41
Faith group	faithgrp	
0 religious faith ranked 5-9		59
1 religious faith ranked 1-4		53

In other words, among dentists who volunteered two or more times in a year, the odds of them being retired were about 6.6 times the odds of them not being retired. Likewise, among dentists who volunteered two or more times in a year, the odds of them having a strong religious faith motivation were about 3.5 times the odds of them not having a strong religious faith motivation.

Because one of the cells in this analysis (retired dentists who volunteered only one or zero times) contained only two values, we tested the stability of the model by looking at the changes in odds ratios that would occur if one of the retired dentists was moved from the more active to the less active outcome. This change resulted in an odds ratio for current work situation of 3.65 (CI: 0.86-15.46, $p=0.078$) and an odds ratio for faith group of 3.04 (CI: 1.33-6.98, $p=0.009$). Conversely, moving one of the retired dentists from the less active to the more active outcome resulted in an odds ratio for current work situation of 14.80 (CI: 1.74-125.9, $p=0.014$) and an odds ratio for faith group of 3.40 (CI: 1.44-7.99, $p=0.005$). Thus, the magnitude of the odds ratio for current work situation was reduced by about half if one retired dentist was moved from more active to the less active outcome category, and the relationship was then of borderline statistical significance. If the move occurred in the opposite direction, the magnitude of the odds ratio was approximately doubled. In either case, there was minimal effect on the odds ratio for faith group.

Table 7. Summary table of decision information

Variable	χ^2 p-value	Cells \geq 5?	Univar LR χ^2 p-value	Multivar LR p-value
fulltimegrp	0.025	no	0.020	0.122
agegrp2	0.288	yes	0.277	
_lagegrp2_2				0.424
_lagegrp2_3				0.096
_lagegrp2_4				0.285
_lagegrp2_5				0.252
sex	0.183	yes	0.181	0.395
practice	0.694	yes	0.694	0.688
settinggrp	0.569	yes	0.568	0.277
dentschcd	0.211	yes	0.206	
_ldentschcd_2				0.819
_ldentschcd_3				0.465
_ldentschcd_4				0.184
profrespgrp	0.656	yes	0.656	0.678
faithgrp	0.023	yes	0.022	0.002

Table 8. Statistics for final model (n=101, pseudo $R^2=0.099$).

Variable	β hat	SEhat (β hat)	z	p-value	95% CI for β hat	Odds Ratio	95% CI for OR
Current work situation	1.885	0.839	2.25	0.025	0.241,3.530	6.587	1.272,34.116
Faith group	1.26	0.433	2.90	0.004	0.408,2.105	3.512	1.503,8.206
Constant	-2.611	0.982	-2.66	0.008	-4.54,-0.687	0.073	0.011,0.503

Discussion

The major findings of this study are that growth of the Medical Teams International Oregon Mobile Dental Program has decreased over the past decade and has been essentially flat for the past several years. This change in growth patterns does not appear to be due to any single barrier to volunteerism, but to the combined effect of several factors. Although some of these barriers are external to the Mobile Dental Program and cannot easily be changed, there are a number of factors that are internal and within MTI's control. The sum of the positive effects of several relatively small changes should restore a pattern of growth to the program.

Our descriptive analysis of existing records indicated that there are currently just over 200 dentists volunteering in MTI's Mobile Dental Program in the state of Oregon. The bulk of the volunteer work is performed by relatively few individuals, with almost half of all volunteers serving only once in a year. This fraction has increased over the past decade.

Our first specific aim was to test the hypothesis that the growth of the Mobile Dental Program has decreased between 2003 and 2012, using the number of hours donated, the number of dentists volunteering, and the number of clinics held as measures of program activity. Using several types of analyses (change from previous year, joinpoint regression), we concluded that volunteerism increased during the first half of the last decade and growth of the program was positive, whereas volunteerism remained relatively constant during the second half of the decade and growth was essentially zero. This supports our first hypothesis, which was that the growth of the program has

changed. Joinpoint regression indicates that this change in growth patterns occurred between September 2005 and June 2008.

The reasons for the change in growth are not entirely clear. One possibility is related to the timing of expansion to new regions. An additional van was added to the Portland subprogram in 2002, and another in 2004. The Roseburg subprogram was added in 2003, and the Central Oregon subprogram in 2005. Thus, for the first half of the last decade, an additional van was added each year, allowing for expansion into new communities. The increased van availability itself is not likely to account for growth of the program, as van utilization is never 100%. It is more likely that availability of personnel is the limiting factor, and expansion into new communities allows for new recruitment of local dental professionals. There are approximately 3000 dentists in Oregon, and approximately 200 volunteer in the MTI Mobile Dental Program in a given year. Thus, less than 10% of Oregon dentists currently donate time and services to the program. Based on our analysis, almost half of these individuals volunteer only once in a year, and of those, less than half will return the next year. This pattern is typical of volunteers in nonprofit organizations (7), and is not unique to MTI. However, these numbers indicate a large untapped pool of potential volunteers, even considering that some of these dentists volunteer elsewhere. It may be that only a small percentage of dentists are committed to making volunteering a regular part of their lives, so that within a year or two of expanding into a new community, virtually all of those who wish to volunteer have been recruited. This idea is supported by the findings (Figures 3-5) that in general, the number of volunteers in a subprogram reaches a maximum about two to three years after it begins, and then remains relatively constant thereafter. From this perspective, to change the plateau of the Oregon

program, it will be necessary to continue to add subprograms every one to two years.

Assuming that patients are not the limiting factor, another alternative would be to use new marketing strategies to recruit new volunteers to grow the program. There may be ways to tap the potential of the remaining 90% by developing a more active recruitment policy, including word of mouth activities by current volunteers and enticements such as community dentistry training, oral surgery classes, and continuing education credits for volunteers. An additional approach would be to entice existing volunteers to serve more hours.

One of our original hypotheses was that a change in patient demographics (specifically a reduction in the percentage of patients who are children) was associated with the reduction in volunteerism in the Mobile Dental Program. We did find that the fraction of patients who are children has decreased from 34% to 15% over the past five years, probably due to changes in government programs such as the Oregon Health Plan, which now covers dental services for children, as well as initiation of other free programs for children such as the Tooth Taxi. This shift may affect the motivation of some dentists to volunteer. However, the results of our survey suggest that a preference for working with children may not be a major factor in the choice to volunteer for MTI: less than 3% of respondents “strongly agreed” with the statement that patient demographics were a barrier to volunteering, and less than 10% “agreed” with it. Moreover, of those who indicated an age preference, more than half (5 out of 9) preferred adult patients over children, and 7 specifically preferred not to work with children. Thus, although the MTI patient base has changed over the past few years, the shifts in patient demographics would seem to favor preferences associated with increased volunteerism. Regardless, it

may be possible to motivate some dentists who state a patient age preference to volunteer by scheduling them for clinics in which the patient age is generally predictable and/or scheduling them for service with another dentist who has the opposite or no specific preference.

We also hypothesized that the advent of competing programs was a major determinant of a reduction in volunteerism in the MTI Mobile Dental Program. We did find that volunteering elsewhere was ranked highest on average of the nine barriers to volunteerism. However, only about one-fourth of all respondents indicated that it significantly limited their volunteering with MTI. Unfortunately, the presence of competing programs is an external factor about which MTI can do little. Indeed, as all of these programs share the same overall goal, to make oral health available to those who cannot afford to pay for it, competition in a business sense is not deemed appropriate and MTI seeks to cooperate with other programs when possible. One thing MTI can do is to attempt to serve those patients who are not being reached by other existing programs. Another is to attempt to motivate and mobilize dentists who are not currently volunteering in alternative programs. MTI can also focus recruitment efforts toward dentists who are in or nearing a transitional stage in their careers (e.g. retirement), providers for whom new volunteer opportunities may be especially attractive. Finally, it will be important to maximize the volunteer capacity of existing volunteers by making it easy and enjoyable to serve.

Another of our original hypotheses was that factors affecting the providers' ethic/attitude (including educational experience with community dentistry and financial factors) are major determinants of a reduction in volunteerism. It appears that limited community

dentistry experience is perceived by dentists to be less of a barrier to volunteering than are financial factors. Financial factors (specifically, the need to pay off school loans) were ranked sixth out of nine potential barriers, whereas little community dentistry experience was ranked eighth. Keeping in mind that the mean age of respondents was 53 years and the mean time since graduation from dental school for respondents was 24 years, it is likely that many of our respondents have already paid off their school loans. Indeed, 24% of respondents ranked this choice last, whereas 23% ranked it first or second. Thus, for many of those who still have loans, it is likely an important barrier to volunteerism. Although development of a type of loan repayment program may be outside of the mission of MTI, this possibility should at least be considered. Interestingly, school loans only account for the personal financial commitments that limit volunteerism in about half of respondents who indicated that finances were a significant barrier.

Only 5% of survey respondents indicated strong agreement or agreement that a lack of comfort in working with some of the Mobile Dental patients was a barrier to their volunteer service, whereas 79% indicated disagreement or strong disagreement. Thus, this would not appear to be an important barrier. However, it is possible that the importance of limited community dentistry experience as a barrier to volunteerism is underestimated by our study. As a group, it is likely that MTI volunteers either have more experience in community dentistry or are the sort of people who need less experience in order to feel comfortable with such work than do the general population of dentists. Therefore, the need for strengthening community dentistry education to draw new people into volunteering opportunities may be greater than suggested by our results.

Facilities were ranked on average as the #2 barrier to volunteerism; however less than 11% of respondents indicated that the facilities significantly limited their volunteering. This suggests that most volunteers acknowledge that the facilities are not ideal, but this is mainly an annoyance that will not prevent them from serving. The main concerns pertained to cramped space, inconvenient conditions for left-handed dentists, and outdated equipment. Some of these concerns will be more easily addressed than others. However, it is likely that most changes in this category will require expenditure of additional funds to reconfigure the vans or purchase updated equipment.

The volunteer dentists recognize that patient scheduling and urgency issues exist, but these do not appear to limit volunteerism for the vast majority of respondents. Scheduling (clinics over- or under-scheduled) appears to be only a minor concern: less than 4% of respondents indicated that they either strongly agreed or agreed with the statement that scheduling issues limited their volunteer service. More dentists were concerned about whether patient needs were truly urgent - nearly 13% either strongly agreed or agreed with the statement that this concern limited their service. Scheduling and urgency issues were ranked #4 and #5 as barriers, and 41% of respondents indicated that if MTI staff would work with partner organizations to address these issues it would improve their volunteer experience. The goal of the Mobile Dental Program is to treat patients with urgent dental needs who cannot afford to pay for those services. Many dentists may be concerned that inefficiency of scheduling reduces the number of patients they can serve, and that scheduling of patients with non-urgent needs prevents some with urgent needs from receiving care. As scheduling of patients is done by the partner organizations, and respondents were specific about which partners tended to schedule non-urgent patients,

this issue can be addressed by having MTI staff communicate directly with those organizations.

Approximately 14% of respondents indicated that their volunteer service is limited because they prefer not to do some types of procedures. Two main types of procedures are done in the Mobile Dental clinics: restorations and extractions. Interestingly, approximately the same number of dentists indicated preferring not to do restorations as those preferring not to do extractions. A reluctance to perform extractions may stem from a lack of experience, or recent experience, in doing this procedure, as well as a concern about what steps could be taken if extraction in a particular patient proves to be more difficult than originally thought. The idea suggested by the second focus group about offering classes in oral surgery for volunteers may be a good approach to addressing this issue. It will also be important to make volunteers aware that there are several volunteer oral surgeons in the Mobile Dental Program to whom difficult cases could be referred.

Although the personal health of volunteers appears to be a limiting factor for only a small percentage (4.5%) of respondents, it is more of a concern for the overall program because the older, retired dentists volunteer more frequently than their younger colleagues and thus bear a large share of the workload. Of the 6 respondents age 74 or older, 4 volunteered 6-23 times in the past year, and 2 volunteered 24 or more times in the past year. In some regions a single retired dentist staffs a large proportion of the clinics held. Loss of individuals such as these due to health issues can have a major impact on the productivity of the program.

It is particularly notable that no respondent indicated strong agreement that his/her service was limited because it was difficult to work with MTI staff or other volunteers, and less than 3% indicated agreement with this statement. Indeed, 2/3 of respondents indicated strong disagreement with this statement. Thus, overall the staff members appear to be well-liked and respected, which is extremely important for the success of a program that is run on volunteers. There is no indication from the survey results that any staffing changes are in order (other than additions as needed to grow the program).

In several cases it would seem on the surface that the responses to the survey questions are internally inconsistent. For example, facilities were ranked as the #2 barrier, yet less than 11% of respondents indicated that the facilities significantly limited volunteering. For the most part, these apparent inconsistencies can be explained by the differences in style of the different questions. The ranking question forced respondents to prioritize potential barriers, even if an individual did not find any of the barriers to be particularly bothersome. Nineteen respondents did not answer “strongly agree” or “agree” to any of the Likert-type questions. Indeed, several respondents commented in a free response section that they were basically happy with the program and did not personally feel that any of the potential barriers were limiting. This feeling could be expressed in response to Likert-type questions, but not in response to the ranking question. However, use of both types of questions allowed us to assess the relative importance as well as the individual importance of each factor, even if for some volunteers the factors were merely annoyances and not limiting to their volunteer service.

The results of the logistic regression analysis are interesting. We considered a variety of variables, including those describing demographics, work environment, and training. We

also included indices of two motivations for volunteer service: a sense of professional responsibility and religious faith. We dichotomized the outcome (dependent) variable, volunteer service activity, into those dentists who volunteered only once or not at all, and those who volunteered two or more times over the past 12 months. We found that of these variables, only an individual's current work situation (retired or not retired) and whether or not religious faith is an important motivator, were important predictors of volunteer activity. Holding faith motivation constant, the odds of volunteering two or more times in a year for retired dentists are 6.6 times the odds for dentists who are not retired. The exact magnitude of this association must be viewed with caution, as one of the cells in the analysis (retired dentists who volunteered ≤ 1 time in the past year) contained only two values. We assessed the stability of the model by considering models in which we moved one retired respondent from the more active to the less active category, or in which we moved one respondent in the opposite direction. The magnitudes of the odds ratios were changed by factors of ~ 0.5 and ~ 2 , respectively, but the direction of the relationships remained the same. Thus, our conclusion that retirement status is predictive of volunteer activity is reasonable, and would likely hold true with a larger sample size as well. Indeed, the fact that retired dentists tend to serve frequently is well known among MTI staff. This is not surprising, as retired dentists have more discretionary time and often want to keep using their professional skills. It does suggest that recruitment efforts directed at recent retirees and those nearing retirement may be more likely to yield new volunteers who will serve frequently.

We also found that motivation by religious faith is an important predictor of volunteerism. Holding retirement status constant, the odds of volunteering two or more

times per year for those ranking religious faith highly as a motivator (ranked 1-4) are 3.51 times the odds for those ranking religious faith lower as a motivator (ranked 5-9).

Medical Teams International is a faith-based organization, and it is not clear whether these findings would hold true for non-faith-based organizations. However, just over half (53%) of respondents in our survey ranked faith low as a motivator, so the analysis was not dominated by one group. These findings suggest that targeting recruitment efforts toward dentists participating in faith-based organizations (churches, study groups, etc.) may yield more active volunteers.

Two other variables deserve mention: age and prior community dentistry experience in dental school. If we relaxed the significance level for inclusion in the model to $p < 0.20$, then the backward stepwise procedure included these variables. Being in the middle age group (46-55) was associated with more frequent volunteering (OR= 2.23, $p=0.195$), as was spending ≥ 10 days/yr in community dentistry in dental school (OR= 2.29, $p=0.111$). The addition of these variables does not change the direction of the relationships with retirement status and faith motivation, but does make them stronger (OR= 9.53, $p=0.010$ and OR=4.49, $p=0.001$, respectively).

Limitations of the study. Although we conducted this study as carefully and rigorously as possible, several potential limitations must be considered. The first is generalizability. We looked at volunteerism in a single organization, and therefore our conclusions are specific to the context of dental care provision and Oregon.

Second, the response rate to our survey was low, causing concern for selection bias. The survey was sent to 530 volunteers with apparently active e-mail addresses, of whom 214

had served in the past year. Some had not volunteered for MTI for 10 years, and many had served only one time. We were unable to obtain current e-mail contact information for some dentists, and those without valid contact information are more likely to be older, retired, or less committed to the program than are those for whom we had information. Thus, we likely do not have a truly representative sample of volunteers. Although we attempted to call all of the volunteers for whom we had telephone numbers but no e-mail addresses, many dental offices were unwilling to provide e-mail addresses to us. In some cases the volunteer no longer worked at the practice and they could not provide current information. We were unable to send out the survey link or a paper survey by U.S. Mail to volunteers due to funding and time limitations, however, if we had done so this might have increased the response rate.

We do not have demographic data (age and sex) on current volunteers, so we cannot tell whether our survey sample is representative in this regard, although the distributions appear to be reasonably close to those of current volunteers. The distribution of survey respondents may be somewhat biased toward more active volunteers when compared to the distributions of volunteers in earlier years. In 2012, 43% of volunteer dentists served only one time. However, of the survey respondents who indicated service in the past year, only 24% were one-time volunteers. Thus, 76% of survey respondents who volunteered last year served two or more times, whereas only 57% of all 2012 volunteer dentists served two or more times. It is likely that there was some non-response bias, because dentists who served two or more times are more likely to be satisfied with most aspects of the program. Thus, our data may underestimate the importance of the barriers identified.

The distribution of survey respondents was also weighted toward those from urban areas. In 2012 the distribution of volunteers by region was as follows: Portland (39%), Salem (34%), Roseburg (13%), and Central Oregon (13%). As shown in Table 2, 51% of survey respondents were from the Portland area, 33% from Salem, 7% from Roseburg, and 8% from Central Oregon. Thus, if there are barriers that are more important in one geographic region than another, the importance of these will be underestimated for those in rural areas.

As indicated above, some survey respondents had not served with MTI recently and many had only served one time. Thus, a large proportion of the respondents did not have a strong investment in the program, and may not have remembered the details of their experience. Because we asked volunteers to remember their volunteer experiences over a time period of up to 10 years, it is possible that some recall bias was introduced. It is likely that strongly negative experiences would be recalled most easily, particularly if they were not buffered by surrounding positive experiences. However, there were few strongly negative experiences reported, so either the number of such occurrences is low, they were sufficiently overshadowed by positive experiences to be overlooked, or volunteers who had bad experiences did not respond to the survey.

We chose to conduct an anonymous survey in the hope that it would encourage participation as well as honesty in the responses. However, the fact that the survey was anonymous precluded follow up with our target population. As the questions in the survey do not deal with sensitive or personal issues, future surveys by MTI might use an identified approach. Resource limitations and the desire to avoid requirements for informed consent drove our choice towards an anonymous survey. We do intend to send

out a follow up letter to the entire group, possibly summarizing the results of the survey as well as requesting that those who indicated particular suggestions or requests contact us individually (e.g. those who said, “Just call me more often”).

Recommendations:

Based on the results of this study, there are several steps that can be taken to improve volunteerism among dentists. It is likely that in itself each change will have only a moderate effect on volunteer activity and retention, however taken together the cumulative effect may be substantial. We recommend that:

1) The MTI Mobile Dental Program should change recruitment strategies for its volunteer dentists. The present, mostly passive, process should be converted to a more intentional, active one that specifically targets particular groups of dentists. The results of our regression analysis suggest that dentists who are nearing retirement or newly retired should be actively recruited. This could be done through class reunions as well as articles, editorials, and advertisements in local society journals or newsletters. Although recruitment should not be limited to these organizations, our results suggest that targeting dentists through faith-based organizations and groups may result in volunteers who are particularly committed to more frequent service. Word-of-mouth recruitment of colleagues of current volunteers should be encouraged, possibly by some sort of campaign (e.g. Bring a Colleague on the Van with You) to expose potential volunteers to the experience in a non-threatening way. In all recruitment materials (articles, flyers, advertisements), the writer should explain the tangible benefits of volunteering (including available CE credits).

- 2) The MTI leadership should encourage regular (quantifiable) communication between staff and volunteers. In particular, this should include van managers asking whether individual volunteers are available and willing to serve more frequently.
- 3) The MTI staff should begin to hold clinics on evenings and weekends regularly, and to advertise these new opportunities to dentists who may not currently be regular volunteers. We would suggest beginning with one evening and one weekend clinic per month per van, and then expanding this as more volunteers are recruited.
- 4) MTI staff should work with specific partners to improve triage, thus ensuring that the goals of the program are upheld. Partners who cannot or will not make quantifiable increases in the fraction of patients who have truly urgent dental needs should be dropped from the program.
- 5) MTI staff should find ways to provide midmorning snacks to volunteers on the van. This could be done through recruitment of non-dental volunteers or through a request to partner organizations.
- 6) MTI should arrange to offer a class in oral surgery techniques that carries continuing education credit for volunteers. If at all possible, this class should be offered at low cost or free of charge to those who volunteer in the program. Tuition reimbursement after volunteer service would be one possible strategy.
- 7) MTI should publicize that they will cover the costs of malpractice insurance for retired volunteers, and should arrange to cover these costs for those whose regular insurance does not cover service in the mobile clinics. This could involve a system whereby premiums are reimbursed after a specified number of hours of service.

- 8) MTI should work to get the fees for volunteer licenses reduced, or cover the costs of volunteer licenses for retired volunteers.
- 9) MTI should consider offering a class in community dentistry that carries continuing education credit for volunteers. It might be possible to offer this class in conjunction with the oral surgery class so that participants would have to make only one commute.
- 10) MTI should set priorities for updating equipment in the mobile clinics and devise strategies to obtain this equipment. Possibilities for reconfiguration of the van facilities should be kept in mind for the future as new vans are purchased.
- 11) MTI should explore the possibility of adding a new region (Eugene area?) to the program. This would involve a market analysis to determine what venues are already available to low income patients in the area, how great the need is, and what the potential volunteer pool looks like. New funds and likely new personnel would be required to support addition of a new region, but at the beginning it might be possible to utilize the existing vans by efficient scheduling.
- 12) MTI should identify new ways to attract new dentists into the program. These may include working closely with the OHSU School of Dentistry to develop ways for appropriately supervised dental students to earn credit for the procedures they do in the mobile dental clinics. MTI staff should also assess the feasibility and appropriateness of implementing some sort of loan repayment program for newly graduated dentists.

Public Health Implications:

The need for oral health care is great among low income Oregon residents. As long as health care, including dental care, is not made available to all individuals regardless of age through government-sponsored insurance programs, these patients will have to rely on essentially free care from volunteer providers in venues such as the MTI Mobile Dental Program. However, the landscape of health care coverage in Oregon is changing, particularly with the recent advent of coordinated care organizations (CCOs). The goal of CCOs is eventually to include dental health care under their umbrella, and this should make dental care more affordable for some patients. Yet the current need exceeds the capacity of all combined safety net programs. Furthermore, in many areas of the state (particularly rural areas) there is a shortage of providers, and especially of providers who accept discounted dental plans. Thus, it is unlikely that there will be a significant drop in demand for programs such as the MTI Mobile Dental Program in the near future. However, it is possible that these changes in the health care system could have a negative effect on volunteerism: once CCOs are in place, there may be a perception among volunteers that the needs of low income people have been addressed through policies and programs, such that their services are no longer needed.

Understanding the motivations of those who volunteer and the barriers to those who do not should help all such programs to increase their volunteer base and thus enable them to reach more patients with the care they need. This will result in better oral health, and because oral health is a determinant of overall health, will improve the health of Oregonians statewide.

Future Directions:

As is a product of any good study, the present work suggests opportunities for additional work in the future. As an extension of the present study, it would be interesting to interview and/or survey a third group of stakeholders – the patients – as the ultimate goal of the program is to serve them. We do not know from the present data how the Mobile Dental Program is perceived by the patients or what changes might be implemented to help them achieve better oral health. We might also consider getting input from another group of stakeholders, the donors. Understanding their motivations, goals, and concerns might open dialogs and eventually result in greater financial support for these programs. Finally, we had originally hoped to collect data from a group of dentists who have never volunteered with the program for the present study, but were prevented by time and logistical factors from including this group. It would be informative to see how their perceptions of volunteerism differ from those of current or previous volunteers.

Another future goal would be to make select changes in the program as indicated in the Recommendations, and reanalyze volunteer data in 2-3 years to see if they have made a positive difference.

Summary and Conclusions

The goals of this study were to determine whether there has been a decrease in volunteerism among Oregon dentists at Medical Teams International over the past ten years, and to determine the factors most likely to act as barriers to volunteerism within this group. We found that the growth of the Mobile Dental Program, measured by number of volunteer dentists, number of hours served and number of clinics held, has plateaued. We also found that relatively few individuals perform the bulk of the volunteer work, with almost half of the total volunteers serving only once in a year. The proportion of patients who are children has fallen by more than half over the past five years. The most important motivators for volunteer service are a feeling that doing so truly makes a difference in the lives of some of the patients, and a sense of professional responsibility. Overall, current and former volunteers seem to be relatively satisfied with most aspects of the program. The most important barriers to volunteering are a lack of time, alternative volunteer opportunities, and personal financial commitments, including a need to pay off school loans. Patient age or other demographics, a preference not to do certain procedures, and issues with the mobile clinic (van) facilities were less frequently mentioned by survey respondents. Retirement status and religious faith as a motivator are strongly predictive of frequency of volunteerism. Although some of the barriers to volunteerism are external factors over which Medical Teams International has little control, the cumulative effect of a number of specific steps that can be taken should restore the growth of the program.

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Appendices

Appendix A: Focus group protocol

Appendix B: Focus group discussion questions

Appendix C: Electronic survey questionnaire

Appendix D: Text of e-mails used for recruitment

Appendix E. Executive summary

Appendix A: Focus group protocol

Specific Aim #2. To determine the factors affecting volunteer interest and retention in dental professionals who have volunteered at least once with MTI over the past 10 years. We will design and administer a survey that specifically asks about reasons for and barriers to volunteering, including competing volunteer programs, patient demographics, financial considerations, year of graduation from dental school, educational experience in community dentistry, and sense of professional social responsibility.

To obtain the perspectives of dental professionals and MTI staff on volunteerism, and to help shape our hypotheses and survey questions, we will conduct focus group discussions with representatives of each of three groups: dentists who currently volunteer with MTI, dentists who have never volunteered with MTI, and MTI staff members involved with the Mobile Dental Program. Each session will include approximately six participants.

The focus group meetings will be held in a conference room at the MTI headquarters in Tigard, Oregon. To accommodate the dentists participating, the groups may be held in the evening. Ideally, all participants will be present in person; however, to facilitate inclusion of representatives from rural areas of the state, we are also equipped to have participants join us by conference call or Skype if necessary.

Interview guides will be prepared to structure the discussions. Each discussion will follow the following framework, utilizing open-ended questions:

Q1: Do you believe that a lack of access to good dental care is an important issue for low income individuals, and thus an important public health problem, in Oregon?

Q2: What do you feel are the most important factors that motivate dentists to volunteer their services to low-income patients?

Q3: What do you feel are the most important barriers to volunteerism among Oregon dentists (in other words, what would limit or prevent dentists from volunteering their services in the Mobile Dental Program or elsewhere)?

Q4: What are specific aspects of the MTI Mobile Dental Program that you feel might prevent or limit volunteerism among Oregon dentists? Which of these are the most important barriers?

Q5: (The facilitator will mention any of the potential barriers included in our hypotheses that have not come up spontaneously in the focus group discussion.) How important do you feel each of these additional potential barriers is in limiting volunteerism?

The focus groups will be held in a conference room that will comfortably hold all participants, with doors that can be closed to provide privacy and discourage distractions.

Chairs will be arranged around a table so that participants are facing each other. Coffee, tea, water, and snacks will be served. Out of respect for the participants' time, every effort will be made to conduct the groups in an efficient manner. Introductions will be made, and the facilitator will briefly review the background of the project and the purpose of the focus group. She will discuss and answer all questions related to protections of confidentiality and disclosure.

The facilitator will be assisted by a note taker. We would like to make audio recordings of the sessions, and we will request permission to audio record the focus groups prior to beginning the discussions. If the group cannot reach consensus to allow audio recording, we will rely on handwritten notes.

Audio recordings will be transcribed within two weeks of the focus group sessions. The audio tapes will then be destroyed. The paper transcripts will not include any personal identifying information. The paper transcripts will be retained in a locked, fireproof file cabinet in the Department of Public Health and Preventative Medicine at OHSU for three years (the time period required to develop reports and obtain acceptance of manuscripts for publication) and then will be destroyed.

Appendix B: Focus group discussion questions

Q1: Do you believe that a lack of access to good dental care is an important issue for low income individuals, and thus an important public health problem, in Oregon?

Q2: What do you feel are the most important factors that motivate dentists to volunteer their services to low-income patients?

Q3: What do you feel are the most important barriers to volunteerism among Oregon dentists (in other words, what would limit or prevent dentists from volunteering their services in the Mobile Dental Program or elsewhere)?

Q4: What are specific aspects of the MTI Mobile Dental Program that you feel might prevent or limit volunteerism among Oregon dentists? Which of these are the most important barriers?

Q5: (The facilitator mentioned any of the potential barriers included in our hypotheses that did not come up spontaneously in the focus group discussion.) How important do you feel each of these additional potential barriers is in limiting volunteerism?

Appendix C: Electronic survey questionnaire

You are receiving this survey because you are a dentist who has volunteered in the Mobile Dental Program at Medical Teams International within the past ten years. Thank you for volunteering with us! We at MTI strive for excellence, and we want the Mobile Dental Program to provide high quality dental care with positive experiences for both volunteers and patients. Toward this end, we want to identify, from the professional's perspective, areas in which we are doing well, as well as ways we can make volunteering an even better experience.

This survey should take only about ten minutes. Your responses are anonymous. No one will be able to connect your questionnaire to you personally. We very much appreciate your honest answers.

Part 1. Please supply the following information by checking the spaces that apply to you or filling in the blank.

1. How many years have you volunteered with the MTI Mobile Dental Program?

Enter number of years.

2. In which of the following locations do/did you volunteer most often?

- Portland area (Krista, Bill, Suzette)
- Salem area (Denny)
- Roseburg/Douglas County area (Tim)
- Central Oregon (Debbie)

3. In the past 12 months, how many times did you volunteer with the MTI Mobile Dental Program?

- 0
- 1
- 2-5
- 6-23
- 24 or more

4. What was the most recent year in which you volunteered with MTI?

Please estimate if you don't know the exact year.

5. How old are you?

Enter age in years.

6. What is your gender?

- Female
- Male

7. What year did you graduate from dental school?

(Enter 4-digit year, for example 1990)

8. How would you describe your dental practice?

- General dental practitioner
- Dental specialist (please specify)

9. Is (was) your main practice in a private, corporate, or academic setting?

- Private
- Corporate
- Academic

10. Which of the following best describes your current work situation?

- Employed full time (4 or more days per week)
- Employed part time (less than 4 days per week)
- Retired
- Other (please specify)

Part 2.

11. Which of the following statements best describe what motivates you to volunteer as a dental professional? (Please number from 1 to 9 with 1 being the most important factor motivating you and 9 being the least important.)

<input type="text"/>	I feel that I make a difference in the lives of some of these patients.
<input type="text"/>	Patients are grateful for the care I provide.
<input type="text"/>	I enjoy working with MTI staff and other volunteers.
<input type="text"/>	I believe that as a dental professional I have the responsibility to provide care to the underserved.
<input type="text"/>	My religious faith places an emphasis on serving people in need.
<input type="text"/>	As a volunteer I learn a lot.
<input type="text"/>	It promotes my personal growth and self esteem.
<input type="text"/>	It strengthens my community.
<input type="text"/>	Volunteering gives me added professional experience.

Part 3. Many dentists volunteer often in our Mobile Dental clinics. Others have a variety of reasons why they cannot or do not choose to volunteer as frequently.

Using the following scale, please indicate the degree to which you feel each of the items below limits your participation in volunteer service in the MTI Mobile Dental Program. (For example, for the following question, if you volunteer in other programs and that limits your participation in the MTI program, check "Strongly agree". If you volunteer in other programs but that doesn't affect your participation in the MTI program, check "Strongly disagree". If you don't volunteer in other programs, check "Strongly disagree".)

12. My service with MTI is limited by my participation in other programs or venues (e.g. OrMOM, Compassion Clinics) in which I volunteer or provide free care.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Which other programs/venues do you volunteer with and how often (how many days per year) do you volunteer with each?

14. What aspects of this/these other programs make them attractive to you?

15. My service with MTI is limited because of the facilities.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

16. Which aspects of the facilities do you find to be the biggest barriers to volunteering?

17. My service with MTI is limited because it is difficult to work with some of the staff or other volunteers.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

18. Which aspects of personnel do you find difficult to work with?

19. My service with MTI is limited because of personal financial commitments.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

20. My service with MTI is limited because I need to maximize my time in my practice to pay off school loans.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

We recognize that getting a dental education and setting up a practice are very expensive ventures. It might be possible to develop a type of loan repayment program to help with educational debt in exchange for volunteer service.

21. Do you still have outstanding dental school loans?

- Yes
- No

You may clarify or comment on this question here.

22. My service with MTI is limited because I prefer to work with patients of a particular age or other demographic group.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

23. What are your preferences in terms of the patients you would like to work with, and why?

24. What are your preferences in terms of the patients you would not like to work with, and why?

25. My service with MTI is limited because I feel that the clinics are over- or under-scheduled.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

26. My service with MTI is limited because I feel that the patients' dental needs are sometimes not truly urgent.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

27. As you may know, patients are screened and clinics are scheduled by our partner agencies, and this process is more successful with some partners than with others.

If you answered Strongly agree or Agree to one or both of the previous two questions, please describe your specific concerns regarding clinic scheduling or patient needs. Please indicate whether you feel that the issue occurs with a specific clinic (partner) or more generally.

28. My service with MTI is limited because I'm not entirely comfortable working with some of the patients served by the Mobile Dental Program.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. Additional educational experience in community dentistry would increase my comfort level with and ability to serve MTI Mobile Dental Program patients.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

30. Please use the following to describe the character of your dental school community dentistry experiences (check all that apply).

- Non-operating experiences (screening, health education) in freshman and sophomore years
- Non-operating experiences (screening, health education) in junior and senior years
- Clinical operating experiences in junior year
- Clinical operating experiences in senior year

31. Please use the following to describe the average amount of time you spent on community dentistry experiences in dental school (specify only one).

- 1 day or less per year
- 2-5 days per year
- 6-9 days per year
- 10 or more days per year

32. During dental school, did you volunteer in community dentistry clinics beyond regularly scheduled programs (for instance Saturday mornings)?

- Yes
- No

33. My service with MTI is limited because I prefer not to do some types of procedures.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

34. Which procedures do you not enjoy doing? (Choose all that apply.)

- Restorations
- Extractions
- Other (please specify)

35. My service with MTI is limited because of my health.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

36. Could we change the facilities or clinics to accommodate your health needs and allow you to volunteer more often? If so, how?

37. My service with MTI is limited because I don't have time to do volunteer work.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree

38. Please describe any other factors that you feel significantly limit your volunteer participation.

In the following question you are asked to summarize your feelings about how the factors considered above limit your volunteer participation by prioritizing them.

39. Which of the following best describe the most important factors that limit or prevent you from volunteering in the MTI Mobile Dental Program? (Please number from 1 to 9, with 1 being the most important barrier for you and 9 being the least important.)

<input type="text"/>	I volunteer elsewhere.
<input type="text"/>	I find the facilities difficult to work in and/or the equipment difficult to work with.
<input type="text"/>	It is difficult to work with some of the staff or other volunteers.
<input type="text"/>	I need to maximize my income to pay off school loans.
<input type="text"/>	I only want to work with patients of a particular age.
<input type="text"/>	I feel that the clinics are over- or under-scheduled.
<input type="text"/>	I feel that too many patients' needs are not urgent.
<input type="text"/>	I didn't get much community dentistry experience in dental school.
<input type="text"/>	My health limits my participation as a volunteer.

Part 4.

40. Which of the following are things we could do to improve your volunteer experience with the Mobile Dental Program? (Check all that apply.)

- Provide a seminar or other type of background information/training on community dentistry (cross-cultural issues or working with indigent patients).
- Work with partner organizations to improve clinic scheduling, ensure that patients have urgent needs, and help clinics to flow more smoothly.
- Work to develop some type of loan repayment program for volunteers to help with educational debt.
- Update the equipment on the vans so it is more like what I use in my dental office.
- Hold more clinics during evening or weekend hours.
- Offer a class in oral surgery for volunteer dentists.
- Provide thank you gifts or awards for volunteers who serve frequently.
- Other (please specify)

Thank you for taking the time to respond to this survey. We appreciate all you do to help meet the oral health needs of low income people in our community, and we hope that the results of this survey will help us to make volunteering with Medical Teams International an even more rewarding experience.

Appendix D: Text of e-mails used for recruitment

For recruitment of the focus group participants:

Dear _____ ,

At Medical Teams International we strive for excellence, and we want the Mobile Dental Program to provide quality oral health care with positive experiences for both patients and providers. To help us achieve and maintain these high standards, we are in the process of designing an electronic survey to assess motivations for and barriers to volunteering among Oregon dentists who have served in our program. This is part of a research project being conducted in collaboration with Oregon Health & Science University (IRB00009265).

Because you are a dentist practicing in Oregon or retired and have demonstrated an interest in the Mobile Dental Program [or you are a member of the MTI Mobile Dental Program staff], we would like to invite you to participate in a focus group to provide input on factors to be considered in the survey. You are under no obligation to participate. If you choose to participate, you will join a group of approximately six dentists and/or MTI staff to discuss a short list of questions about volunteering in the Mobile Dental Program. We will meet at the MTI headquarters in Tigard at some mutually convenient time, for approximately one hour. Your responses to the questions and contributions to the discussion will be confidential. Although we may request your permission to audio record the discussion, your name and other identifying information will not be associated with your specific responses or comments.

You may not personally benefit from participation in the study. However, you will have the satisfaction of knowing that your input was crucial in helping us to design a quality survey instrument that will in turn contribute to providing good dental care for Oregon's poorest citizens. Hopefully, the results of the survey will also help us to improve your experience if you volunteer as a provider in the Mobile Dental Program.

If you are willing to participate in a focus group, please respond to this e-mail in the affirmative and we will contact you to schedule a specific meeting time. If you have questions about the project, you may contact Dr. Bill Lambert, Department of Public Health & Preventive Medicine, Oregon Health & Science University at (503) 494-9488.

Thank you.

Initial recruitment letter for survey participants:

Dear Current or Former MTI Volunteer Dentist,

You are receiving this letter because you are a dentist who has volunteered with the Medical Teams International Mobile Dental Program within the past ten years. As you know, oral health is an important contributor to overall health, yet many low income people in Oregon are unable to afford good dental care. We are very grateful for your willingness to volunteer as we seek to meet the dental needs of these members of our community.

At MTI we strive for excellence, and we want the Mobile Dental Program to provide high quality care with positive experiences for both patients and providers. With this goal in mind, we would like to get your perspective on the work that we do and the way in which we do it.

We are fortunate to be collaborating with Dr. Lori Woods in this effort. Dr. Woods is a former Research Professor of Medicine at Oregon Health & Science University, who has returned to school to work on a Master in Public Health degree in epidemiology and biostatistics, with a Concentration in Global Health. Lori brings many years of experience in medical research, as well as fresh skills in epidemiology and biostatistics, to this research project, which will also serve as the basis for her thesis (OHSU IRB00009265).

Below is a link to our online research survey designed specifically to address factors that may encourage your participation in volunteer work, as well as those that may serve as barriers to your involvement. The survey is anonymous, and should only take about ten minutes of your time. We anticipate using the results of this project to inform our decisions regarding changes we make in the program. Hopefully, any changes we make will improve your experience as a volunteer. Even if you no longer volunteer with us, your responses are vital in allowing us to provide the highest quality care possible for this most needy group of the Oregon community, and you will have the satisfaction of knowing that you have helped us in this effort.

If you volunteered with us in 2012, you may have received a general MTI volunteer satisfaction survey at the end of last year. This one is different, designed specifically to help us evaluate and improve the Mobile Dental Program, and it is only being distributed to dentists. From a scientific perspective, your participation in the present survey is important, even if you give some of the same responses you have given previously.

If you have any questions, you may contact Matt Stiller, Manager of the Mobile Dental Program, at (503) 624-1095.

Link to survey: http://www.surveymonkey.com/s/MTI_Mobile_Dental_Survey

(If clicking on the link does not work, you can copy and paste it into your browser. You should not be asked for a password.)

Sincerely,

Jeff Pinneo, CEO



OHSU eIRB#9265

Reminder e-mails:

Subject line: Medical Teams International Dental Survey Reminder

One week ago, you should have received an e-mail requesting your participation in an anonymous electronic survey designed to address factors that may encourage your participation in volunteer work, as well as those that may serve as barriers to your involvement. If you have already responded to this request, we thank you for your participation. If you haven't yet completed the survey, we encourage you to do so using the link below. Your opinions are important to us, and by sharing your perspectives you will help us to provide the highest quality dental care to Oregonians who cannot afford to pay for these services.

Thank you.

[Link to Survey](#)

Subject line: Medical Teams International Dental Survey Final Reminder

This is just a reminder that the dental volunteer survey will close on [in three days]. If you have completed the survey, please disregard this message. If you haven't already done so, we would greatly appreciate it if you would click the link below to provide your input about motivations for and barriers to volunteering in the Medical Teams International Mobile Dental Program. It should only take about ten minutes.

Thank you.

[Link to Survey](#)

Appendix E: Executive summary

The level of activity of the Oregon Mobile Dental Program has changed over the past ten years. For the first part of the decade the program grew, due in part to addition of new vans and expansion into new regions. Growth, as measured by number of volunteers, total volunteer hours, and number of clinics held, has plateaued and essentially has been flat in recent years. Currently, relatively few individuals perform the bulk of the volunteer work, with almost half of the total volunteers serving only once in a year.

To gain insight into the barriers to volunteerism among dentists, we conducted two focus groups and we sent an e-mail survey to 530 dentists who had volunteered at least once in the Oregon program over the past decade. The survey response rate was 22%. One third of the respondents had not volunteered within the past year. Overall, current and former volunteers were satisfied with most aspects of the program. The most important barriers to volunteering were a lack of time, alternative volunteer opportunities, and personal financial commitments, including the need to pay off school loans. As many as 15% of respondents considered other barriers important, including preferences for working with either children or adults, a preference not to do certain procedures, and issues with the mobile van facilities such as older clinical equipment. Dentists who were retired, or who were motivated by their religious beliefs, were more likely to volunteer two or more times within the past year.

Overall, the most important barriers to volunteer activity are factors external to the program itself and therefore are not directly under the control of MTI. Even so, focus group and survey information suggests several changes that should help to increase the pool of available volunteers. We recommend that MTI:

- 1) Change recruitment strategies from a mostly passive process to an active one that specifically targets dentists who are nearing retirement or have recently retired from practice.
- 2) Publicize that MTI will cover the costs of malpractice insurance for retired volunteers, and arrange to cover these costs for those whose regular insurance does not cover service in the mobile clinics.
- 3) Work to get the fees for volunteer licenses reduced, or cover the costs of volunteer licenses for retired volunteers.

In addition to adjustments to encourage volunteering by retired dentists, other adjustments may enable working dentists to volunteer time and improve their experience:

- 1) Begin to hold clinics on evenings and weekends.
- 2) Encourage regular communication between staff and volunteers.

- 3) Work with specific partners to improve triage.
- 4) Provide snacks to volunteers on the van.
- 5) Offer a class in oral surgery techniques that carries continuing education credit for volunteers.
- 6) Consider offering a class in community dentistry that carries continuing education credit for volunteers.
- 7) Set priorities for updating equipment in the mobile clinics and devise strategies to obtain this equipment.
- 8) Identify new ways to attract new dentists into the program, including working closely with the OHSU School of Dentistry to develop ways for dental students to earn credit for the procedures they do in the mobile dental clinics.

Finally, MTI should also explore the possibility of adding a new region to the program. Expansion into new communities would not only serve new patients, but would also provide a new pool of dentists from which to recruit volunteers.