1. **Achievement of Goals and Objectives**  
   a. The DNSL sought to use trained lay volunteer leaders to transmit diabetes-related knowledge and skills in community-based, non-medical locations with two primary objectives: to improve patient knowledge and self management behaviors and to influence the quality of primary care provider services for program participants. Both assessments collected and anecdotal responses self-reported in groups demonstrate that both knowledge and behavior were positively impacted. The following specific participant behaviors all changed for the positive:
   
   **Individuals**
   
   - “Followed an eating plan” - increased from 2.6 to 3.5 days.
   - “Consumed 5 or more fruits or vegetables” - increased from 3.5 to 4.1 days.
   - “Were physically active” - increased from 2.48 to 3.49 days.
   - “Monitored their blood glucose” - increased from 3.5 to 4.7 days.

   The indirect approach to primary care by patient-directed requests did succeed in increasing patient-physician communication but the final data analysis is underway.

   b. Two questions were designed to be answered. One asked if a structured diabetes education and empowerment intervention by trained volunteers can improve short-term diabetes outcomes (A1c, BP) and patient knowledge and satisfaction? December 2010’s analysis indeed proved that biometric measures can be improved. Baseline A1c’s positively changed from an average baseline of 7.40% to a follow-up of 7.19% (T-test=3.491, p=0.001 N= 201 with pre and post). Blood pressure results showed diastolic changes from an average baseline of 78.3 lowered to a follow-up reading average of 76.1 (T-test=2.680, p=0.008 N= 188 with pre and post) and systolic changes from a baseline of 141.3 to a follow-up of 137.5 (T-test=2.818, p=0.005 N= 189 with pre and post). All were significant differences. An increased level of diabetes-related knowledge and participant satisfaction is assumed to have been generated with these positive health-related biometric outcomes but additional data is still to be analyzed.

   A second question asked if a structured diabetes education and empowerment intervention by trained volunteers could impact the physician-patient interaction. This question ties in with the outcome desire that was already mentioned, to influence
provider services. Letters to physicians were generated by a subset of “groups” which, when completed and sent, provided specific biometric outcomes and health information and presented choices in questions that participants could ask their doctors. This action, in and of itself, caused a change in both the manner of interaction and in the type of information given on behalf of the patients (group participants) thereby impacting physician-patient interaction. Questionnaires given to group participants during follow-up meetings provided data, which will allow for evidence-based analysis. This is being completed.

2. **Major accomplishments**

   a. To date, the DNSL has successfully reached 474 group participants and held groups at 36 different locations widely dispersed in all geographic directions about the St. Louis area. Thirty volunteers actively engaged in the implementation of the DNSL project and 27 became trained as DNSL volunteers and actively led community-based diabetes education groups.

   b. Analysis done in December of 2010 showed that 52% of the participants were African American and 4% “Other,” demonstrating the project’s ability to reach minority populations. A related success was the translation of the DNSL curriculum into Spanish, accompanied by the successful implementation of a volunteer-led group into a free medical clinic for Spanish speaking individuals, Casa de Salud. In addition, this curriculum has made its way to Peru, South America where a version of it is currently being implemented. A similar translation of the curriculum is being implemented in India by Dr. Santosh Gupta.

   c. American Diabetes Association national meeting presentations 2009, 2010 and 2011; all related to the MFH funded BSMOD program.

3. **Challenges faced in connection with the BSMOD project**

   a. **Volunteer identification and training** - It was more difficult to attract and train volunteers than originally thought. A variety of marketing techniques needed to be designed and implemented as a way of attracting potential volunteer leaders. In addition, due to the time commitment expected of a volunteer in order to be trained, individuals originally interested in possibly becoming a volunteer DNSL leader would decide not to start or cease to continue with the training process. The volunteers that did become fully trained, however, became truly dedicated and hardworking leaders.
b. **Data** – The real world character of the community sites and the structure of the groups limited the ability to obtain the desired information. The materials were decreased based on the initial feedback and the timing of the various questions and surveys were reduced in number and spread out over the course of the sessions. This impacted both the completeness and the amount of data collected in aggregate. The primary focus on starting new groups and training participants placed the data entry piece as a lower priority.

c. **Project Design Reconfiguration** – The ability to start with an organization and then develop a leader was not time efficient. We eventually developed a model of training leaders and sharing these leaders with potential sites. The sites and the organizational ability to recruit participants was highly variable. Although some sites did well with program promotion, others did not apply as much effort and the number of participants was smaller as a result. This was despite the efforts of the leaders and the supporting DNSL staff.

4. **Lessons learned. Recommendations for other organizations planning to implement a similar project.**

   a. When working with partner organizations, outline in a written format specific activity expectations and hold the organization accountable to meeting the project requirements.

   b. The need to effectively identify and train potential leaders suggests that physician partners need to assist in the identification of leaders, who can then be placed in the community.

   c. A cohesive and comprehensive promotional plan is needed to effectively reach a large number of participants.

   d. The initial design of the project invested a significant amount of the staffing dollars into the IFM and CHIPS partners. This had a negative effect on the project due to staff turnover and shifted focus at these organizations. We feel that it would have been more effective to centralize the FTE’s in one organization or to have contracted staff allocated to the project.

   e. Community based education programs reach a population that is in need of support but has already reached a decision to participate in their disease management. We tried to recruit patients from the medicine clinic at WU targeting 200 individuals with
a documented A1c >9%. This group was given a financial incentive to attend, yet only 3 attended. The need to support individuals willing to make the behavioral changes is a strength of the program but it requires an initial commitment and follow through. The medicine clinic group was less willing to make this commitment.

f. The A1c did improve overall for the DNSL participants. The individuals with a reasonable A1c < 8.0% all had benefit in regard to self management behavior. We had 105 individuals whose baseline A1c was < 7 and 46 individuals whose baseline A1c was > 8. The group > 8 showed an improvement in their A1c from an average of 9.6-9.1%.

5. What changed within the target population, organization and community as a result of BSMOD and anticipated continued follow-up beyond MFH’s grant period.

a. The target population was individuals with diabetes in the St. Louis area with an emphasis on reaching minority populations and individuals of a lower socio-economic background. The DNSL reached a combined 56% African American or “other” and 56% had annual incomes < $30,000 (analysis 12/2010). As a result of the DNSL project, individuals in need of care were referred to a medical home and individuals engaged in a broader depth of communication with their doctors. This was evidenced by case reporting during group sessions and the sending of diabetes-specific letters to medical providers. Personal biometric and diabetes care information was sent to individuals’ physicians and chosen questions were asked. Analysis specific to the impact of the letters is yet to be analyzed but we do know that letters were sent and specific information gathered as a result of DNSL group biometric testing and education was shared, all actions that would not have taken place but for the DNSL project.

b. In terms of organization and community impact, sites widely-dispersed around the St. Louis geographic area recognized diabetes as a health concern able to be addressed at the community level and provided education to members of their organization and community. Thirty seven sites held diabetes education groups, of which 22% held more than one session. In addition, 19% of the organizations have plans to continue with diabetes education programs, additional organizations would hold future groups if asked, and newly-identified organizations interested in providing DNSL groups continue to present themselves. A large untapped resource is the doctors of DNSL group participants. A potentially-significant percentage of these doctors will have recognized the value of this program and as a result of positive feelings derived from their patients increased diabetes knowledge and/or health status, could be an excellent source for both future group participants and/or volunteer lay leaders.
c. Active sources of funding are being sought through the Barnes Foundation to continue the DNSL program. The ability to train the leaders remains as a fundamental operational principle of the diabetes Center. Private donors have contributed directly to this project and additional grant support is being sought.

d. The training of the leaders improved and expanded the role of the CDE educators in the Diabetes Center.

e. The participants improved their daily self management skills and positively impacted each other. Some of these participants became dynamic leaders for the project and continue to promote education and diabetes self management.

6. Key organizations and partners who played a role in the project and a description of their role.

a. Community Health In Partnership Services (CHIPS) a St. Louis clinic designed to provide health care for the under-served and un-insured and the Institute for Family Medicine (IFM), an organization of physicians dedicated to providing accessible healthcare services to disadvantaged and underserved children and families both were contracted DNSL partners. Both organizations were instrumental in identifying potential community-based sites and assisting with the implementation of DNSL volunteer-led diabetes education sessions.

b. Barnes Jewish Hospital Volunteer Office (BJHVO) – The DNSL partnered with BJHVO in the training of the diabetes group lay leader volunteers. The BJHVO provided the guidelines and oversight of general volunteer requirements (HIPAA, TB testing, Flu vaccinations, safety, orientation and annual reorientation, …) while Washington University School of Medicine’s DNSL project manager provided oversight to the DNSL diabetes program-specific volunteer training.

c. The St. Louis Diabetes Coalition – A grassroots organization, the St. Louis Diabetes Coalition formed in response “community leadership concerns about the availability of high quality diabetes care for all people.” The Coalition’s mission is “to work collaboratively to improve diabetes care that results in sustainable clinical outcomes across our community.” Partnership with the coalition has been instrumental in both the promotion and provision of the DNSL education groups and in the acquisition of volunteer DNSL leaders and group participants. In addition, coalition nurses engaged in the biometric testing both at baseline (meeting #1) and at follow-up (meeting #6). The cost of this service was paid for by the grant funding but did again bring in
additional professional diabetes expertise and clinical experience for the group participants.

d. Saint Louis University Center for Outcomes Research – Eric Armbrecht, PhD is Assistant Professor of Medicine and also the Acting Director for the Diabetes Coalition. He has been serving as the Co-Principal Investigator for the DNSL Pilot Project research study and is active with the DNSL project promotion and implementation.

e. Saint Louis University School of Public Health - Michael Elliott, PhD Assistant Professor of Biostatistics with the Department of Community Health is the DNSL project statistician and assists with project data analysis and presentation.

f. Community-based churches/parish nurses – Many churches in the St. Louis area chose to hold DNSL groups. Several parish nurses demonstrated interest in the DNSL program, held several group sessions and have voiced the desire to continue to house future DNSL groups. The DNSL-Parish nurse relationship accelerated in the last year of the three-year grant indicating that further expansion is possible in the future.

g. Other Civic Centers – Libraries, YMCA’s, public health clinics, a homeless shelter and several mental health service agencies are all examples of sites where DNSL groups met to provide community-based diabetes education. One mental health agency has continued to provide a separate diabetes education program and another has continued to provide the DNSL group education program, with additional sessions planned for the future.

h. Washington University School of Medicine and The Washington University Diabetes Center at BJH was the principal driver of the project. It served as the coordinating organization for the community based groups and leaders. Training of the leaders was accomplished with the resources of the Center which included CDE RN’s, CDE RD’s and Physicians. Dr. Garry Tobin, Director of the Diabetes Center, has been serving as the CO – PI for the DNSL program. The curriculum and structure of the program was designed by Dr. Tobin and Dr. Armbrecht. Dr. Tobin has been instrumental in recruiting leaders from the center’s well-trained diabetic patients. Coco Bopp MEd (project Coordinator) has been involved in the training and daily coordination of leaders as well as data retrieval for the overall project.