

**ADVISORY COMMITTEE ON TRAINING  
IN PRIMARY CARE MEDICINE  
AND DENTISTRY**

***EVALUATING THE IMPACT OF TITLE VII, SECTION 747  
PROGRAMS***

**5th Annual Report to  
the Secretary of the  
U.S. Department of Health and Human Services  
and to Congress**

**November 2005**

The views expressed in this document are solely those of the Advisory Committee on Training in Primary Care Medicine and Dentistry and do not necessarily represent the views of the Health Resources and Services Administration nor the United States Government.

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# ADVISORY COMMITTEE ON TRAINING IN PRIMARY CARE MEDICINE AND DENTISTRY

Section 748 of the Health Professions Education Partnerships Act of 1998 authorizes the establishment of an Advisory Committee on Training in Primary Care Medicine and Dentistry. The Act directs the Secretary to establish an advisory committee to be known as the Advisory Committee on Training in Primary Care Medicine and Dentistry. The Advisory Committee was constituted to:

- 1) Provide advice and recommendations to the Secretary concerning policy and program development and other matters of significance concerning the activities under section 747.
- 2) Not later than 3 years after the date of enactment, and annually thereafter, prepare and submit to the Secretary, the Committee on Health, Education, Labor and Pensions of the Senate, and the Committee on Energy and Commerce of the House of Representatives, a report describing the activities of the Advisory Committee, including findings and recommendations made by the Advisory Committee concerning the activities under section 747.

Congress created the Advisory Committee to obtain insight and objectives from primary healthcare providers, educators, and trainees who work on the front line. The members below include such health professionals as physicians and physician assistants, as well as general and pediatric dentists, from the disciplines of primary care medicine and dentistry.

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## ACKNOWLEDGMENT OF PUBLIC COMMENT

The Advisory Committee on Training in Primary Care Medicine and Dentistry appreciates the comments provided on the draft report during the public comment period. Many thoughtful comments were received, and these were considered carefully in preparing the final report. The organizations providing comments included:

- Academic Family Medicine Advocacy Alliance
- American Academy of Pediatric Dentistry
- American Academy of Pediatrics
- American Dental Association
- American Dental Education Association
- American Osteopathic Association
- Association of Academic Health Centers
- Association of Pediatric Program Directors
- National Alliance for Hispanic Health
- Society of General Internal Medicine
- Society of Primary Care Policy Fellows

This acknowledgment is not to imply that these organizations endorse the content of this report.

# ABSTRACT

A well-prepared, effective primary care workforce reduces healthcare costs and plays a significant role in the prevention of disease and the management of both acute and chronic conditions. Over the past 40 years, the Title VII, section 747 programs have transformed the medical and dental landscape with their increased emphasis on the education and training of the primary care workforce. These programs have developed and expanded education and training programs for primary care providers and promoted diversity in the workforce. In addition, the programs have ensured that health professions curricula respond to the changing demands and emerging health needs of the U.S. population, including addressing the disparities in health outcomes of vulnerable groups.

The legislative intent for Title VII, section 747 has evolved over the years in response to the changing healthcare workforce needs and demands. The initial legislative purpose of Title VII, section 747 programs, created in 1963, was to increase the general supply of physicians. In successive reauthorizations, the focus of the Program shifted to education and training of primary care providers, later to addressing geographic distribution problems of healthcare providers and, more recently, to education and training of primary care providers to serve medically and dentally underserved populations and high-risk groups.

Title VII, section 747 programs form the centerpiece of the Health Resources and Services Administration's (HRSA's) efforts to prepare the primary care health workforce. HRSA programs tend to work synergistically and complement one another. For example, Title VII, section 747 programs educate and train high-quality primary care providers, many of whom go on to join the National Health Service Corps (NHSC) and/or work in community, migrant, and rural health centers. In this way, Title VII, section 747 programs support the overall workforce goals of HRSA's Bureau of Health Professions (BHP).

The evaluation of Title VII, section 747 programs has been challenging for two major reasons. First, the ability to define meaningful longitudinal outcome measures for the programs has been complicated by the changing nature of the legislation. Second, the myriad related programs funded by Title VII, section 747 and Title VIII (which supports nursing grant programs) under HRSA has created some blurring of program goals, making it difficult to ascertain the discrete contributions of individual programs to specific outcomes.

Evaluations that have examined specific educational and clinical outcomes of Title VII, section 747 programs have found beneficial impact. Studies have shown that Title VII, section 747 helped develop high-quality primary care education and training programs, established and maintained family medicine departments, and through the training of a primary care workforce, helped decrease the number of Health Professional Shortage Areas (HPSAs). However, the assessment done of these programs by the Office of Management and Budget (OMB) was more critical in substance and tone. In aggregating 40 separate health professions programs, including the lumping together of Title VII, section 747 and Title VIII programs in its assessment process, OMB was not able to isolate the specific effectiveness of Title VII, section 747 programs. Although Title VII, section 747 programs work synergistically with other programs in HRSA's portfolio, they are specifically designed to bring about significantly different outcomes from those of other programs. Collectively, the programs contribute to HRSA's overall goals.

The focus of this report is to clarify the purpose and objectives of the Title VII, section 747 Program and to put forward recommendations regarding outcome measures for evaluating Program impact based on the Program's purpose and objectives. Based on the legislation, this purpose includes provision of funding for approved training of students, interns, and residents in family medicine, general internal medicine, and general pediatrics; training of physician assistants; training of residents in general dentistry and pediatric dentistry; and training of individuals who plan to teach in family medicine, internal medicine, pediatrics, and physician assistant training programs.



## CONCLUSION

Evaluations of Title VII, section 747 programs in the past have not always been based on well-defined outcome measures that are directly related to the Program's purpose and objectives. Adoption of a consistent set of outcome measures, based on Program purpose and objectives, will facilitate more meaningful assessments of the Program's impact and foster continuous program improvement.

## RECOMMENDATIONS

Consistent with the stated purpose:

*To educate and train physicians, pediatric and general dentists, and physician assistants to enhance the quality, capacity, and diversity of the Nation's primary care workforce, giving special consideration to the healthcare needs of underserved populations and other high-risk groups.*

The Advisory Committee on Training in Primary Care Medicine and Dentistry (ACTPCMD) recommends that:

1. The outcome measures utilized to evaluate Title VII, section 747 programs should reflect the Program's statutory focus on health professional education and training.
2. The proposed logic model and near- and longer-term outcome measures should guide the evaluation of Title VII, section 747 programs.
3. Outcome measures should be identified that evaluate the synergistic role of Title VII, section 747 programs with other Bureau of Health Professions (BHP) programs, especially the National Health Service Corps (NHSC), as well as the Health Careers Opportunity Program (HCOP), Area Health Education Centers (AHECs), and Rural Interdisciplinary Training.
4. BHP should develop procedures for data collection, analysis, and reporting of Program outcome measures.
5. Additional financial resources should be made available to BHP to implement effective evaluation processes for the programs in Title VII, section 747.

## EXECUTIVE SUMMARY

A well-prepared, effective primary care workforce reduces healthcare costs and can play a significant role in disease prevention and management of chronic illnesses. Title VII, section 747 programs have transformed the medical and dental education landscape with their increased emphasis on primary care education and training. The programs have helped to create a diverse, broadly competent primary care medicine and dentistry workforce. Title VII, section 747 programs have also improved the Nation's health by training a quality primary care healthcare workforce, particularly for medically and dentally underserved populations.

Over the past 40 years, Title VII, section 747 has contributed to the development and expansion of education and training programs for primary care providers, promoted diversity in the workforce, and helped to ensure that health professions curricula respond to the changing demands and emerging needs of the U.S. population. Such demands and needs include addressing the disparities in health outcomes of vulnerable groups. The initial legislative purpose of the Program, created in 1963, was to increase the general supply of physicians. In successive reauthorizations, the focus of the Program shifted to production, education, and training of primary care providers, later to addressing geographic distribution problems of healthcare providers and, more recently, to education and training of primary care providers to serve medically and dentally underserved populations and high-risk groups.

Title VII, section 747 programs form the centerpiece of the Health Resources and Services Administration's

(HRSA's) efforts to prepare the primary care health workforce. HRSA programs tend to work synergistically and complement one another. For example, Title VII, section 747 programs educate and train high-quality primary care providers, many of whom go on to join the National Health Service Corps (NHSC) and/or work in federally funded community, migrant, and rural health centers. In this way, Title VII, section 747 programs support the overall workforce goals of HRSA's Bureau of Health Professions (BHP).

The evaluation of Title VII, section 747 programs has been challenging for two major reasons. First, the ability to define meaningful longitudinal outcome measures for the programs is complicated by the changing nature of the legislation. Second, the myriad related programs funded by Title VII, section 747 and Title VIII (which supports nursing grant programs) under HRSA has created some blurring of programs goals, making it difficult to ascertain the discrete contributions of individual programs to specific outcomes.

Evaluations that have examined specific educational and clinical outcomes of Title VII, section 747 programs have found beneficial impact. Some studies have found that Title VII, section 747 encouraged and sustained development of primary care training programs. Others have shown that Program support leads to the establishment and maintenance of family medicine departments and associated production of family physicians. Others have developed analyses demonstrating that increasing the funding rate would reduce time required to eliminate Health Professional Shortage Areas (HPSAs). Some studies conclude that there are increased retention rates of family medicine faculty in funded institutions. Still other studies have demonstrated that increased service by alumni of Title VII programs was provided to those in need. However, the assessment of these programs done by the Office of Management and Budget (OMB) was more critical in substance and tone. In aggregating 40 separate health professions programs, including the lumping together of Title VII, section 747 and Title VIII programs in its assessment process, OMB was not able to isolate the specific effectiveness of Title VII, section 747 programs. Although Title VII, section 747 programs work synergistically with other programs in HRSA's portfolio, they are specifically designed to bring about significantly different outcomes from those of other programs. Collectively, the programs contribute to HRSA's overall goals. The OMB assessment failed to evaluate Title VII, section 747 programs based on the outcomes they were designed to bring about.

The Committee believes that OMB's view, that health professions training programs are diffuse and subject to interpretation, points to the need to clarify the purpose and objectives of Title VII, section 747 programs. The purpose of this report is not only to clarify the purpose and objectives of the Program, but also to put forward recommendations regarding outcome measures for evaluating the impact of Title VII, section 747, based on the Program's purpose and objectives. Based on the legislation, this purpose includes provision of funding for approved training of students, interns, and residents in family medicine, general internal medicine, and general pediatrics; training of physician assistants; training of residents in general dentistry and pediatric dentistry; and training of individuals who plan to teach in family medicine, internal medicine, pediatrics, and physician assistant training programs.

Based on a review of authorizing legislation and broader goals of BHP and an examination of the past successes and capabilities of the Program, it is the Committee's view that the primary purpose of the Title VII, section 747 Program is:

*To educate and train physicians, pediatric and general dentists, and physician assistants to enhance the quality, capacity, and diversity of the Nation's primary care workforce, giving special consideration to the healthcare needs of underserved populations and other high-risk groups.*

Further, the Committee believes that there are seven key objectives for these programs.

## KEY OBJECTIVES

1. Improve the quality of education and training of the Nation’s primary care workforce.
2. Improve the capacity for education and training of the Nation’s primary care workforce, with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.
3. Improve primary care education and training -curricula.
4. Improve primary care faculty development.
5. Identify, develop, and disseminate primary care education and training innovations and best practices among programs, accrediting bodies, and other constituents.
6. Improve the preparation of faculty, residents, and students (or learners) to work with medically and dentally underserved populations and build linkages to communities.
7. Improve the diversity and number of primary care faculty and students (or learners), with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.

In this report, the term “disadvantaged” is used to refer to those individuals who are either economically or educationally disadvantaged. The term is broadly inclusive of racial minorities, ethnic minorities, and poor whites (Anglos). Individuals from disadvantaged backgrounds do not fit geographic boundaries. They can exist in rural and frontier communities as well as in urban and suburban communities.

## THE COMMITTEE’S APPROACH TO IDENTIFYING OUTCOME MEASURES

To identify scientifically sound and programmatically relevant outcome measures for the seven key objectives above, the Committee conducted an assessment that included:

- Review of the literature on evaluation of education and training programs
- Development of a Title VII, section 747 Program logic model
- Review of BHP’s goals and Title VII, section 747’s role, as part of a portfolio of programs, in meeting those goals

In the first step, the Committee conducted a review of the literature to identify and assess research on the evaluation of education and training programs with respect to education outcomes, workforce outcomes, and healthcare outcomes. The objectives of this step were to identify methodologically sound approaches for the evaluation of education and training programs and to identify candidate outcome measures for Title VII, section 747 objectives.

In the second step, the Committee developed a logic model for the Title VII, section 747 Program. A program logic model is a tool that provides a simplified visual representation of how a program or project is expected to work to achieve intended results (Schiller, 2004). A program logic model links outcomes (both near- and long-term) with program activities and processes as well as the theoretical assumptions and principles of the program (W.K. Kellogg Foundation, 2004). The logic model facilitated the identification of near- and long-term measures associated with the seven Program objectives. The chart on the next page (Figure 1) sets out the Committee’s model for how Title VII, section 747 programs achieve their outcomes. Each near- and longer-term outcome has been referenced to one of the seven key objectives for the programs.

In the third step, the Committee reviewed BHP’s goals and Title VII, section 747’s role in helping to achieve those goals. BHP is in the process of refining outcome measures to evaluate progress on the Bureau’s goals. To help ensure alignment between BHP’s goals and recommended measures for Title VII, section 747 outcomes, the

Committee took into consideration BHPPr's measures in identifying Title VII, section 747 measures.

In considering the findings of this assessment, the Committee identified and prioritized a set of 25 recommended outcome measures. The measures are categorized into two groups: near-term and longer-term. These measures are set out in the chart on the following page (Figure 2).

## CONCLUSIONS

Evaluations of Title VII, section 747 programs in the past have not always been based on the same program outcomes and measures. In some cases, the use of different outcomes and measures has led to conflicting findings regarding the impact of these programs. Adoption of a consistent set of outcomes and measures, based on Program objectives, is important in order to help ensure that programs deliver the intended benefits to stakeholders and constituents. The Committee believes that adoption of the outcomes and measures recommended herein will facilitate more meaningful future assessment of the Program's impact and foster continuous program improvement.

## RECOMMENDATIONS

Consistent with the stated purpose:

*To educate and train physicians, pediatric and general dentists, and physician assistants to enhance the quality, capacity, and diversity of the Nation's primary care workforce, giving special consideration to the healthcare needs of underserved populations and other high-risk groups.*

The Advisory Committee on Training in Primary Care Medicine and Dentistry (ACTPCMD) recommends that:

1. The outcome measures utilized to evaluate Title VII, section 747 programs should reflect the Program's statutory focus on health professional education and training. Evaluation of this Program should focus on preparation of the primary care workforce. External evaluations of the Program should be designed to specifically capture educationally oriented outcomes. Meaningful evaluation should include quantitative and qualitative methods that address quality, capacity, and diversity. Outcome measures should encompass physician assistant training, pre-doctoral training, academic administrative units, primary care residency training, primary care faculty development, and general and pediatric dental residency training.
2. The proposed logic model and near- and longer-term outcome measures should guide the evaluation of Title VII, section 747 programs. Title VII, section 747 programs are diverse and have a variety of both near- and longer-term benefits for learners (students, residents, and faculty) and the populations served. Analysis, interpretation, and presentation of data should address various outcome measures as outlined in the report. The proposed logic model demonstrates the complex, multi-factorial set of interrelationships and influences on Program outcomes (see section entitled *Description and Method for Reading the Logic Model*, page 13) and provides a framework to identify and select programmatically relevant outcome measures.
3. Outcome measures should be identified that evaluate the synergistic role of Title VII, section 747 programs with other Bureau of Health Professions (BHPPr) programs, especially the National Health Service Corps (NHSC), as well as the Health Careers Opportunity Program (HCOP), Area Health Education Centers (AHECs), and Rural Interdisciplinary Training. Evaluation of these programs should primarily focus on the preparation, education, and training of the primary care workforce. Evaluation should include the synergism between Title VII, section 747 and other BHPPr programs such as HCOP, AHECs, and Rural Interdisciplinary Training. Although placement of program graduates in underserved settings is not a principal focus of Title VII, section 747 programs, it strongly impacts the preparation of healthcare professionals to assume roles for other BHPPr programs. Evaluation could include how these programs have properly trained professionals to serve in

underserved settings and in programs like the NHSC and community, migrant, and rural health centers, as well as to care for underserved populations and high-risk groups.

4. BHPr should develop procedures for data collection, analysis, and reporting of Program outcome measures. BHPr should oversee the process of collecting, analyzing, and reporting qualitative and quantitative data associated with outcomes. These outcome measures should be developed and implemented consistent with the logic model, objectives, and near- and longer-term outcomes presented in this report. The process developed must provide meaningful reporting on Program effectiveness without placing undue burden on grantees for collecting data.
5. Additional financial resources should be made available to BHPr to implement -effective evaluation processes for the programs in Title VII, section 747. The systematic evaluation of outcomes is critical to ensuring the effectiveness of Title VII, section 747 programs. However, establishing and sustaining effective evaluation methods is labor-intensive and expensive. Therefore, additional funds are necessary to develop an ongoing process for data collection, analysis, and reporting of program outcome measures. It should be noted that any plan to reassign funds from current Program allocations would strongly compromise this process and jeopardize the intended outcomes of these programs.

Figure text for Executive Summary-----

### **Figure 1. Title VII, Section 747 Logic Model**

***Inputs***  
***Activities***  
***Outputs***  
***Near-Term Outcomes***  
***Longer-Term Outcomes***

Title VII, section 747 legislative authority  
Title VII, section 747 funding  
DHHS and BHPr infrastructure

Education and training grant management  
Operation of contracts and co-op and collaborative agreements

Education and training grants, faculty development, and curricular innovations  
Cost-effective management of funding mechanisms  
Timely approvals, disbursements, and receipt of grantee submissions

O1: Improved primary care education and training curricula  
O6: Increased ability of learner and faculty to serve high-risk, special needs, and vulnerable populations  
O2: Improved primary care training capacity  
O7: Increased diversity of primary care faculty, residents, and students  
O3: Increased training in underserved communities

O1: Improved primary care workforce training and quality  
O2: Improved capacity of primary care training infrastructure  
O7: Improved diversity of graduates (including underrepresented minorities)  
O3: Increased primary care providers serving high-risk and underserved populations  
O1: Goals met from *Healthy People 2010*

ACTPCMD  
COGME  
Public and private partnerships

Partnership development  
Primary care research and policy development

Partnerships  
Workforce studies and training research  
Annual reports – research results and recommendations  
Feedback and consensus  
Performance indicators/baseline performance data

O4: Published primary care training and primary care research in priority areas  
O5: Recommendations on policy or National guidelines  
O5: Dissemination of innovations and best practices

O5: Adoption of innovations and best practices by others

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## Figure 2. Recommended Outcome Measures

### Key Objectives

#### *Near-Term Measures* *Longer-Term Measures*

#### 1. Improve the quality of education and training of the Nation's primary care workforce.

- Evidence of competency of learners and faculty, as demonstrated by improvement in knowledge, skills, attitudes, etc.
- Goals met from *Healthy People 2010*

#### 2. Improve the capacity for education and training of the Nation's primary care workforce (with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities).

- Learners and faculty trained
- Retention in primary care
- Primary care training programs created, expanded, or affected as a result of Title VII, section 747 funding

#### 3. Improve primary care education and training curricula.

- Grantees implementing curricula addressing critical healthcare needs as defined in the Title VII, section 747 Guidance
- Hours devoted to curriculum (can include training for culturally effective care)
- Grantees with rural and/or underserved populations training tracks, clinical rotations, etc.
- Programs that address emerging health care needs
- Graduates whose practice focuses on a specific underserved population or on a specific primary care problem

#### 4. Improve primary care faculty development.

- Leadership roles and scholarly output of primary care faculty, as demonstrated by promotion and tenure, presentations and publications, research grants, advocacy, and public and professional service
- Primary care faculty in medical or dental educational institutions over a timeframe
- Primary care trained graduates in faculty positions

#### 5. Identify, develop, and disseminate primary care education and training innovations and best practices among programs, accrediting bodies, and other constituents.

- Primary care education and training publications and research publications, including web-based publications
- Innovations, including use of new technology and best practices developed and adopted by accrediting bodies and others

**6. Improve the preparation of faculty, residents and students (or learners) to work with medically and dentally underserved populations and build linkages to communities.**

- Ambulatory and community-based training sites that serve primarily underserved populations
- Learners who are from disadvantaged backgrounds, who are from rural backgrounds, or who are underrepresented minorities or women
- Disadvantaged, high-risk, and special needs individuals served
  
- Graduates caring for underserved, uninsured, or special needs populations
- Where graduates practice

**7. Improve the diversity and number of primary care faculty and students (or learners), with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.**

- Learners who are from disadvantaged backgrounds, who are from rural backgrounds, or who are underrepresented minorities or women
- Learners among funded programs who indicate at matriculation and graduation that they intend to work in primary care
  
- Underrepresented minority faculty who have completed Title VII, section 747 faculty development programs, and who teach and/or serve underserved populations
- Underrepresented minority faculty involved in leadership or research positions
- Faculty, graduates, and practitioners trained in funded programs who are from disadvantaged backgrounds or who are underrepresented minorities or women

# EVALUATING THE IMPACT OF THE TITLE VII, SECTION 747 PROGRAMS

## BACKGROUND

### Overview of Title VII, Section 747 Programs

Funds from the Title VII, section 747 Program support the education and training of physicians, dentists, and physician assistants. Primary care has been a particular emphasis for Title VII, section 747 programs. Title VII, section 747 defines primary care as the specialties of family medicine, general internal medicine, and general pediatrics, general dentistry, pediatric dentistry, and physician assistants. The Program was created in part to counteract National trends showing a disproportionate increase in the number of medical specialists.

Legislative Acts from 1963 to 1998 have continually shaped the Title VII, section 747 health workforce training programs. The initial legislative purpose of the Program, created in 1963, was to increase the general supply of physicians. In successive reauthorizations, the focus of the Program shifted to the education and training of primary care providers, later to addressing geographic distribution problems of healthcare providers and, more recently, to education and training of primary care providers to serve medically and dentally underserved communities. Thus, the legislative intent for Title VII, section 747 has evolved over the years in response to changing healthcare workforce needs and demands. Key milestones in the legislative history include:

- The initial legislative purpose of the programs was to increase the general supply of physicians and to ensure the financial viability of health professions schools as specified by the 1963 Health Professions Education Assistance Act (Public Law 88-129).
- Under the 1968 Health Manpower Act (Public Law 90-490), the Program expanded to fund additional initiatives to

strengthen, improve, or expand programs to train health professionals.

- The 1971 Comprehensive Health Manpower Training Act (Public Law 92-157) increased support for training primary care medical and dental providers, including for the first time physician assistants, improving the geographic maldistribution, and increasing the number of minorities in health professions. It also provided for start-up and conversion grants, financial distress grants, student loans, health professions scholarships, special projects, health manpower education initiative awards, family medicine training grants, postgraduate training of physicians and dentists, and health professions faculty development.
- The 1976 Health Professions Education Assistance Act (Public Law 94-484) represented a major redesign in primary care training funding and was designed to address specialty and geographic distribution problems.
- In 1992, the Health Professions Education Extension Amendments (Public Law 102-408) redefined training in primary care to include increasing the number of primary care providers for medically underserved communities (MUCs), increasing the number of students entering family medicine, and exposing students to primary care in ambulatory settings. This Act added to Title VII, section 747 a focus for providing for MUCs and targeting primary care providers to fill this need. It continued training in family medicine pre-doctoral, graduate, departmental, and faculty development programs; general internal medicine and general pediatrics graduate training and faculty development programs; dentistry graduate programs; and physician assistant programs.
- In 1998, the Title VII, section 747 programs were reauthorized under the Health Professions Education Partnerships Act of 1998 (Public Law 105-392). The 1998 Act made programmatic changes including allowing BHP additional flexibility in allocating funds among disciplines and in modifying grant programs. In addition, the Advisory Committee on Training in Primary Care Medicine and Dentistry was authorized under section 748 of Title VII.

## **Description of Title VII, Section 747 Programs**

### *Objectives of Title VII, Section 747 Programs*

A well-prepared, effective primary care workforce reduces healthcare costs and can play a significant role in the prevention of disease and the management of both acute and chronic conditions. Supply and distribution of primary care providers are critical to delivering care to underserved populations and communities, both rural and urban; when the ratio of providers to population is low, providers must be able to address a broad range of healthcare needs (Starfield, Simpson, 1993; Hart, 2001). Primary care providers can play a significant role in disease prevention. For example, the future burden of chronic diseases, such as obesity, can be reduced by adequately addressing nutrition and health maintenance during childhood (Krebs, Jacobson, 2003). In other industrialized nations, the primary care physician remains a prominent element of the healthcare delivery system (Starfield, 1992; Macinko, Starfield, et al., 2003), and these nations achieve better health outcomes with fewer resources (Macinko, Starfield, et al., 2003; Organisation for Economic Co-Operation and Development, 2003). There is also compelling evidence of international comparisons that demonstrate better health outcomes and decreased healthcare costs when primary care providers compose over 50 percent of a nation's physicians (Starfield, 1992).

The Title VII, section 747 programs have been very effective in transforming the medical and dental education landscape with their increased emphasis on the education and training of the primary care workforce. The programs have helped to create a diverse, broadly competent primary care medicine and dentistry workforce. Over the past 40 years, Title VII, section 747 has helped to develop and expand education and training programs for primary care providers, promote diversity in the workforce, and ensure that curricula within the health professions respond to the changing demands and emerging health needs of the U.S. population, including addressing health outcome disparities in vulnerable groups. Title VII, section 747 programs are also designed to improve the Nation's health by educating



and training a quality primary care healthcare workforce, particularly for those patients who are medically and dentally underserved.

The Program funds primary care education, faculty development, and the creation of innovative primary care curricula and models of care. The Program has long emphasized education and training of primary care providers for underserved populations, thereby improving the health and quality of life in these populations with an emphasis on prevention and early intervention. The Program has also created a multidisciplinary focus, while supporting primary care leadership development. Title VII, section 747 programs have been unique in attempting to encourage primary care as a career choice among graduates of medical, dental, and physician assistant training institutions.

The current legislation of Title VII, section 747 sets forth a purpose that includes provision of funding for approved training of students, interns, and residents in family medicine, general internal medicine, and general pediatrics; training of physician assistants; training of residents in general dentistry and pediatric dentistry; and training of individuals who plan to teach in family medicine, internal medicine, pediatrics, and physician assistant training programs.

On the basis of review of authorizing legislation and broader goals of the Bureau of Health Professions (BHPr) and an examination of the past successes and capabilities of the programs, the Committee concludes that the primary purpose of Title VII, section 747 programs is:

*To educate and train physicians, pediatric and general dentists, and physician assistants to enhance the quality, capacity, and diversity of the Nation's primary care workforce, giving special consideration to the healthcare needs of underserved populations and other high-risk groups.*

Further, the Committee believes that there are seven key objectives for these programs.

#### *Key Objectives*

1. Improve the quality of education and training of the Nation's primary care workforce.
2. Improve the capacity for education and training of the Nation's primary care workforce, with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.
3. Improve primary care education and training curricula.
4. Improve primary care faculty development.
5. Identify, develop, and disseminate primary care education and training innovations along with best practices among programs, accrediting bodies, and other constituents.
6. Improve the preparation of faculty, residents, and students (or learners) to work with medically and dentally underserved populations and build linkages to communities.
7. Improve the diversity and number of primary care faculty and students (or learners), with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.

In this report, the term "disadvantaged" is used to refer to those individuals who are either economically or educationally disadvantaged. The term is broadly inclusive of racial minorities, ethnic minorities, and poor whites (Anglos). Individuals from disadvantaged backgrounds do not fit geographic boundaries. They can exist in rural and frontier communities as well as in urban and suburban communities.

These seven objectives are important to both stakeholders and constituents of the Program. Stakeholders are entities who are not the direct beneficiaries of the Program's activities, but have a vital interest either as indirect beneficiaries or policy makers. Key stakeholders of the programs include the public and taxpayers, the Congress, the White House, and the U.S. Department of Health and Human Services (DHHS). Constituents are direct beneficiaries

of the programs' activities. Key constituents include grantee institutions and learners at those institutions.

Some objectives are more important to stakeholders, whereas others are of greater concern to constituents. Some objectives are equally important to both. For example, Objective 2, *Improve the capacity for education and training of the Nation's primary care workforce, with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities*, is more important to stakeholders than it is to constituents. Objective 3, *Improve primary care education and training curricula*, is of greater concern to constituents.

The key activities performed in order to achieve the objectives important to stakeholders and constituents are depicted in a strategic framework (Figure 3 on the next page).

#### *Types of Education and Training Programs Supported by Title VII, Section 747 Programs*

The current grant program authorized by the Public Health Service Act, Title VII, section 747 consists of a variety of structures and different funding purposes. BHP's 2005 funding announcement for the Program identified six different funding purposes. These are Residency Training in Primary Care, Pre-doctoral Training in Primary Care, Faculty Development in Primary Care, Academic Administrative Units, Physician Assistant Training, and General and Pediatric Dentistry. Title VII, section 747 programs are funded through the competitive grants and cooperative agreements awarded to organizations that train and educate healthcare professionals at more than 1,700 institutions. The individual program areas are detailed below:

- Residency Training in Primary Care. Plan, develop, and operate or participate in (including provision of financial assistance) approved residency programs in family medicine, general internal medicine, and general pediatrics.
- Pre-doctoral Training in Primary Care. Plan, develop, and operate or participate in (including provision of financial assistance) pre-doctoral programs in family medicine, general internal medicine, and general pediatrics.
- Faculty Development in Primary Care. Plan, develop, and operate (including provision of financial assistance) programs for the training of physicians who plan to teach in family medicine (including geriatrics), general internal medicine, and general pediatrics training programs.
- Academic Administrative Units. Meet the costs of projects to establish, maintain, or improve academic administrative units to provide clinical instruction in family medicine, general internal medicine, and general pediatrics.
- Physician Assistant Training. Meet the costs of projects to plan, develop, and operate or maintain approved programs, as defined in section 799B, for the training of physician assistants and for the training of individuals who will teach in programs to provide such training.
- General and Pediatric Dentistry. Meet the costs of planning, developing, or operating approved residency programs of general or pediatric dentistry, including providing financial assistance to the learners in these programs.

#### *Title VII, Section 747's Influence on the Workforce*

Title VII, section 747 programs form the centerpiece of HRSA's efforts to prepare the primary care health workforce. HRSA programs tend to work -synergistically and complement each other. For example, Title VII, section 747 programs train high-quality primary care providers, many of whom go on to join the National Health Service Corps (NHSC) and/or work in federally funded community, migrant, and rural health centers. The expansion of community health centers and the NHSC are Presidential initiatives. The NHSC is a postgraduate program that presently focuses on loan repayment (80 percent), with a small scholarship component (20 percent) for students who commit to serving in an underserved area upon completion of their education. Title VII, section 747 education and

training programs support HRSA’s overall workforce goals through their complementary relationship with these programs. In addition to directly preparing practitioners of related programs, the presence of Title VII, section 747 programs can indirectly increase overall sensitivity of students to issues related to primary care and underserved populations. For example, many students who go on to do specialty training and set up a practice in a medical or dental specialty routinely provide care to underserved patients. For such specialty providers, service to underserved populations can form a sizeable portion of their practices.

#### *Title VII, Section 747 and Related Federal Programs*

In addition, there are several other related training programs funded by HRSA that, along with Title VII, section 747 programs, influence learners in different stages of their training and education. Potential opportunities to pursue a career in primary care exist along a continuum, or a “pipeline,” of education and training. Title VII, section 747 programs are opportunities at the latter end of this pipeline that expose learners to primary care education and training experiences that may influence their career choices. Examples of related programs in the education and training pipeline include:

- Health Careers Opportunity Program (HCOP). Grants that increase the number of individuals from disadvantaged backgrounds in the health and allied health professions.
- Rural Interdisciplinary Training. Grants that support innovative training that prepares healthcare providers for practice in rural communities. This program is focused on rural areas.
- Area Health Education Centers (AHECs). Academic–community partnerships that train healthcare providers in sites and programs that are responsive to State and local needs.
- NHSC Scholarship Program. A program that provides service-obligated scholarships for students of various healthcare disciplines. In return for the scholarships provided, students are obligated to serve in a Health Professional Shortage Area (HPSA).

Figure 4 on the following page depicts the contribution of these programs in the healthcare provider education and training pipeline and some of the marketplace forces that influence the number of providers.

#### *Title VII, Section 747 and Other Influences on the Workforce*

Programs authorized under Title VII, section 747 are designed to improve health professions education and training and thereby prepare more primary care graduates to respond to the Nation’s well-established healthcare needs. The programs are designed to bring about direct benefits in education and training outcomes. Addressing BHP’s overall workforce goals, however, requires consideration of a complex set of market and social forces that, along with individual preferences, may serve as more powerful influences on individuals considering a career in primary care. Furthermore, individuals who are underrepresented minorities are affected by these same forces and individual preferences in determining their career choices. The Title VII, section 747 programs contribute to BHP’s overall workforce goals through the combined effect of Title VII, section 747 and related BHP programs such as those discussed above. Among these market and social forces are:

- Lifestyle preferences. Lifestyle preferences persist that encourage providers to seek practice locations in affluent suburban and urban areas (Rabinowitz, Diamond, et al., 1999). In addition, perception of a controllable lifestyle, characterized by control over personal time and freedom from practice requirements allowing leisure, family, and avocational pursuits, is a significant factor in specialty choices of graduating U.S. medical students (Dorsey, Jarjoura, et al., 2003). Encouraging providers to settle and practice in rural or underserved areas continues to be a challenge for health workforce planners.
- Insufficient rural residencies. Despite strong evidence that residency graduates are likely to practice near their

training sites, and that rural residency programs graduate higher rates of rural physicians, there is a paucity of primary care residency programs that are actually located in rural areas. Similarly, there is a decreasing number of urban and suburban residency programs that prepare physicians for service in rural and underserved areas through rural training tracks or rural clinical rotations (Schneeweiss, Rosenblatt, et al., 2003).

- Market emphasis on specialty care. Powerful market mechanisms have created disincentives for students to choose careers in primary care and practices in rural or underserved communities. It has become increasingly difficult for a career in primary care to be economically attractive, or in some instances, even viable compared with most other specialties (Larson, Roberts, et al., 2005). Current reimbursement mechanisms for healthcare continue to encourage lucrative careers in specialized practice, rather than in primary care. Primary care practice involves more telephone and e-mail communication with patients and more time spent on management and coordination of care. Payers have been reluctant to cover these services (Ginsberg, 2003).
- Small numbers of ethnic minority students. There continues to be an underrepresentation of certain racial and ethnic minorities in medical, dental, and physician assistant education and training programs. Despite recent rulings supporting some forms of affirmative action, many educational institutions are hesitant to use racial diversity as an explicit factor in selecting students. Certain ethnic and racial minorities are more likely to practice in inner cities. Increased representation in these educational institutions and programs would help to address shortages of health professionals in inner cities.

## **History of Evaluation of Title VII, Section 747 Programs**

### *Summary of Previous Studies Assessing the Title VII, Section 747 Programs*

Studies have demonstrated that Title VII, section 747 has contributed to the development of high-quality primary care education and training programs, established and maintained family medicine departments and, through the training of a primary care workforce, helped decrease the number of HPSAs. Specific studies and their findings are cited below.

Trends in the proportion of U.S. medical school graduates entering primary care in relationship to Title VII funding were explored by Rosenblatt, Whitcomb, and colleagues (1993). They found that Title VII, section 747 encouraged and sustained the development of primary care training programs but was not sufficient in itself to increase substantially the proportion of primary care physicians, given a climate favoring specialty care. Petersdorf (1993) suggested that this finding reflected the small amount of funding involved, and asserted that the Program is beneficial to the extent that it helps initiate and maintain family medicine departments.

In 1994, two General Accounting Office (GAO) reports offered perspectives on the Program. In the July 1994 report, the GAO acknowledged that although there were many challenges to evaluation, the Program was important for funding innovative projects and providing seed money for starting new programs, and that the Program was considered important in the creation and maintenance of family medicine departments (GAO, 1994). In a second report in October 1994, the GAO stated that “students who attended schools with family practice departments were 57% more likely to pursue primary care.” The same report goes on to state that “students attending medical schools with more highly funded family practice departments were 18% more likely to pursue primary care and students attending schools requiring a third-year family practice clerkship were [also] 18% more likely to pursue primary care.”

Baumgartner, Stenersen, and colleagues (1996) reviewed evaluations and studies of 30 Title VII and VIII programs, and noted problems hampering their ability to determine direct effects on provider supply, distribution, and minority representation. These programs included diverse program objectives; lack of common goals, data, and reporting requirements; and an inability to distinguish program effects from other funding sources or external influences.

Politzer, Horab, and colleagues (1997) found that establishment and maintenance of family medicine departments in private schools and their production of family physicians were positively associated with sustained receipt of Title VII, section 747 support. The same authors found less of a correlation between production of generalist physicians and Title VII, section 747 support at public schools. Their research concluded that it is unclear whether continuous receipt of Title VII, section 747 funds results in perpetuation of family medicine departments or the presence of such a department enhances the probability of receiving these funds. In 1999, Politzer, Hardwick, and colleagues simulated the impact that Title VII, section 747 support for generalist production had on reducing and eliminating HPSAs. Each scenario investigated showed that increasing the number of residency programs funded or the rate at which program graduates practice in underserved areas can decrease the time needed to eliminate HPSAs.

A survey examining the retention of recently graduated Title VII, section 747-funded family medicine faculty development fellows in academic medicine (Kohrs, Mainous, 1999) showed a 75 percent retention rate, though long-term retention was not measured. A follow-up survey measured the prevalence of service in underserved areas by Title VII, section 747-funded faculty development fellowship alumni, and demonstrated a high service rate in areas of need among this group (Kohrs, Mainous, et al., 2001).

Fryer, Meyers, and colleagues (2002) evaluated the practice specialty and location of 180,000 medical school graduates to analyze the effects of Title VII, section 747 funding between 1978 and 1993 on the intended outcomes to increase numbers of primary care physicians and to increase practice in rural and underserved areas. Title VII, section 747 funding was associated with higher rates of entry into family practice and practice in HPSAs, and pre-doctoral training and departmental development funding were strongly related to achievement of Title VII, section 747 objectives.

In 2002, a study by the Robert Graham Center for Policy Studies reported that medical schools that received Title VII, section 747 family medicine funds produced more medical students who practiced in family medicine or primary care, in a rural area, or in a HPSA (Fryer, Meyers, et al., 2002).

Edelstein, Krol, and colleagues (2003), found that Title VII, section 747 funding of pediatric dentistry training programs was successful in treating the underserved, in shaping careers dedicated to serving the underserved, and in recruiting underrepresented minority dentists.

A report by the Advisory Committee on Training in Primary Care Medicine and Dentistry (ACTPCMD, 2003) examined the role of Title VII, section 747 programs in educating and training healthcare professionals in cultural competency. The Committee concluded that Title VII, section 747 programs had a clear record of success and should prioritize training programs that address health disparities. In addition, the Committee noted that Title VII, section 747 grant programs have supported each of the ten *Healthy People 2010* Leading Health Indicators. The Committee also noted that programs funded under Title VII, section 747 have significantly increased the number of underrepresented minority enrollees, graduates, and faculty in healthcare education (ACTPCMD, 2004).

The Undergraduate Medical Education for the 21st Century (UME-21) project was funded by BHPPr's Division of Medicine and Dentistry to address training challenges through the development and dissemination of innovations in medical education. In one evaluation of the UME-21 initiative, Veloski and Barzansky (2004) found that there was an increase in seniors' ratings of instruction in the newer areas of evidence-based medicine, quality assurance, and cost-effectiveness in relation to National norms between 1999 and 2001. They concluded that even modest funding focused on specific goals can produce measurable results.

#### *Proposals Within HRSA for Evaluating Program Success*

BHPPr is undergoing a comprehensive review of program-level logic models and performance measures. In addition to program-specific measures, which are designed to capture unique accomplishments of each BHPPr

program, BHPPr is considering a set of five core measure areas, which are designed to capture accomplishments across five common purposes. These broader measures that use aggregated program data include:

- Diversity. Increase health workforce diversity.
- Primary care. Promote careers in primary care.
- Distribution. Improve the distribution of the healthcare workforce.
- Quality. Improve the quality of care.
- Infrastructure. Strengthen public health and healthcare infrastructure.

For each of these goals, the Bureau has proposed a set of performance measures and associated definitions, data sources, list of reporting programs, and a data analysis plan. The result of this work will be a comprehensive performance measurement framework that will improve assessment of each program's contribution to BHPPr goals. In developing this report, the Committee has worked with Bureau staff to ensure recommendations are consistent with program evaluation and performance measurement efforts within BHPPr.

#### *Historical and Recent Evaluations of Title VII, Section 747 Programs by OMB*

Despite recent findings of beneficial impacts on certain education and clinical outcomes, the Office of Management and Budget's (OMB's) assessment of HRSA's health professions training programs (including Title VII, section 747) for fiscal year 2003 resulted in an "ineffective" rating. OMB uses the Program Assessment Rating Tool (PART) to assess Government program performance and inform funding decisions. PART assessments examine program purpose and design; performance measurement, evaluations, and strategic planning; program management; and program results, with the goal of improving programs by identifying their strengths and weaknesses. The PART assessment of HRSA's health professions training programs (including Title VII, section 747) for fiscal year 2003 resulted in an "ineffective" rating.

The assessment aggregated approximately 40 individual health professions programs, and most comments were about the programs as a group. Although the programs received positive assessments on a majority of the PART measures (receiving 60 points out of 100 for "purpose," 71 for "planning," and 73 for "management"), the rating for the programs' "results/accountability" was only 13 out of a possible 100 points. Specific criticisms were leveled at the entire set of health professions programs as a group: their purposes are too diffuse and subject to varying interpretations by interested parties; the programs are under various authorities and not designed to have a significant impact on any one factor such as diversity, distribution, supply, or quality of health professionals; and the health professions programs were not aligned with program goals in a way that the impact of funding, policy, and legislative changes on performance could be readily known. In addition, OMB criticized HRSA for not using performance data to make decisions about the programs and for not supporting sufficient numbers of objective, independent evaluations of the health professions programs. Because it was able to cite only a few studies in this area, OMB answered "no" to the assessment question "do independent and quality evaluations of this program indicate that the program is effective and achieving results?"

As part of its criticism, OMB refers to a study that concludes that graduates of funded programs are only slightly more likely to serve in HPSAs. This is not a valid criticism of Title VII, section 747 programs because the purpose of the programs, as set forth in the legislation, is not specifically to place graduates in HPSAs. Instead, the legislation focuses on educating and training providers to enter primary care, including family medicine, and giving special consideration in the training to the needs of underserved populations. Although not mentioned in the OMB assessment, the same study concludes that "graduates of schools with Title VII, section 747 grants were significantly

more likely to become family physicians and practice primary care than were graduates of schools without funding” (Fryer, Meyers, et al., 2002). According to that same study, 15.8 percent of graduates of funded programs entered family practice versus 10.2 percent of those from non-funded programs. In addition, 36.3 percent of graduates went on to practice primary care versus 30.9 percent of graduates of non-funded programs.

In aggregating 40 separate health professions programs in its assessment process, including lumping Title VII and Title VIII (which supports nursing grant programs) programs together, OMB was not able to isolate the specific effectiveness of the Title VII, section 747 programs, which are designed to bring about significantly different outcomes than other programs in HRSA’s health professions training program portfolio. Although Title VII, section 747 programs work synergistically with other HRSA programs, Title VII, section 747 programs are specifically designed to bring about significantly different outcomes than other programs. Collectively, the programs contribute to HRSA’s overall goals. The OMB assessment failed to evaluate the Title VII, section 747 programs based on the outcomes they were designed to bring about.

These findings point to the need for a clearer paradigm for evaluation of these programs as well as a systematic approach to applying relevant, reliable, and valid measures to the evaluation of Title VII, section 747 programs. Such an effort requires that measures be developed that are scientifically sound and programmatically relevant.

## **Overall Challenges in Evaluating Programs**

The importance of performance measurement and program evaluation has long been recognized. In general, there are challenges to effective evaluation that have inhibited effective study implementation. These challenges include:

- Evaluation of burden of cost, effort and time, and resulting diversion from other goals. Activities associated with evaluation can place a significant burden on constituents. This is especially true when evaluation requires original data collection and data analysis. Grantees tend to have small budgets for evaluation. In addition, Title VII, section 747 is but a small portion of their overall budget, so resources required for evaluation can amount to a significant portion of program funding. Techniques for overcoming this challenge include developing data collection procedures that minimize the data collection burden, for example, through the use of automation, statistical sampling, and data mining of existing sources.
- Difficulty in tracking learners. Once learners have left grantee institutions, it is difficult to keep track of where they are practicing and the kinds of patients they are serving.
- Identification of appropriate measures and evaluation methodologies. The choice of outcome measures used must be scientifically sound and programmatically relevant. If inappropriate measures are chosen, performance measurement systems can encourage behaviors that are contrary to program goals. Measures that are insufficiently balanced can result in excessive focus on one measure at the expense of more important objectives.

## **EVALUATION OF TITLE VII, SECTION 747 PROGRAMS**

### **Framework for Evaluating Title VII, Section 747 Programs**

An important goal of evaluation is to ensure that the desired outcomes are delivered to the intended beneficiaries and that those benefits are delivered in a cost-effective manner for the taxpayer. To support this goal, the evaluation framework set out in this report has four objectives:

- Evaluate Program impact.
- Ensure continued alignment with other BHPPr programs.
- Facilitate Program improvement.

- Continue to validate Program logic model.

#### *Evaluate Program Impact*

The most obvious objective of evaluating Title VII, section 747 programs is to measure the impact the programs have on intended beneficiaries. The extent to which programs are achieving intended results is important information for both stakeholders and program managers. Evaluation of impact supports stakeholders such as the White House, Congress, and the U.S. Department of Health and Human Services (DHHS) in making resource allocation and program design decisions.

#### *Ensure Continued Alignment With Other BHPPr Programs*

Title VII, section 747 programs play a direct or indirect role in each of BHPPr's strategic goals. However, these programs are but one component of a complementary set of BHPPr programs that address the Bureau's goals. Title VII, section 747 programs are focused on building education and training capacity of institutions providing primary care education and training. Ongoing measurement of Title VII, section 747 outcomes can help to ensure that the unique and complementary roles of these programs continue.

#### *Facilitate Program Improvement*

Information on impact supports program managers in making continuous improvements to the programs. Ongoing monitoring of outcomes is essential to determining whether Program activities continue to result in the desired outcomes and determining whether changes or improvements are required. The results of this monitoring will provide information to policymakers so that they can respond to emerging problems or opportunities.

#### *Continue to Validate the Program Logic Model*

Changing environmental factors such as changing market forces, changing demographics, and changes in other Government programs all have the potential to influence the achievement of outcomes. Ongoing monitoring of the outcomes will enable policymakers to continue to validate the logic model as environmental factors change.

### **Challenges in Evaluating Title VII, Section 747 Programs**

The evaluation of Title VII, section 747 programs has been challenging for two major reasons. First, the ability to define longitudinal outcome measures for the programs is complicated by the changing nature of the legislative agenda (see section entitled *Overview of Title VII, Section 747 Programs*, page 1).

Second, the myriad related programs funded by Title VII, section 747 and Title VIII under HRSA has created some blurring of programs and their goals, making it difficult to ascertain the discrete contributions of individual programs to specific outcomes (see section entitled *Historical and Recent Evaluations of Title VII, Section 747 Programs by OMB*, page 8).

### **Approach for Developing Outcome Measures**

In order to identify measures for the seven scientifically sound and programmatically relevant objectives, the Committee conducted an assessment that included:

- Review of the literature on evaluation of education and training programs (see section entitled *Literature Review*, page 11)
- Development of a Title VII, section 747 Program logic model (see section entitled *Description and Method for Reading the Logic Model*, page 13)



- Review of BHPr's goals and Title VII, section 747's role, as part of a portfolio of programs, in meeting those goals (see section entitled *Title VII, Section 747's Influence on the Workforce*, page 3)

### *Literature Review*

The Committee conducted a literature review of research published on evaluation of medical and dental education and training programs. The research was categorized into three outcome groups: education- and training-related, workforce-related, and healthcare-related.

#### *EDUCATION- AND TRAINING-RELATED OUTCOMES*

Education and training outcomes identified in the literature were further categorized into three subgroups: Learner, Curricular, and Institutional. Examples of outcome measures identified in these groups are provided below:

- Learner. Learner outcomes include those related to students, residents, and faculty who participated in the program being evaluated. This category could include outcomes such as student performance on the U.S. Medical Licensing Examination, learner surveys, and peer review. Examples of learner outcomes include:
  - Measured accomplishment of learning objectives such as changes in knowledge, skills, and attitudes (Olney, 1995; Arnold, Blank, et al., 1998; -Holmboe, Hawkins, 1998; Lawrence, Lindemann, et al., 1999; Association of American Medical Colleges, 2000; Peters, Greenberger, et al., 2000; Rabinowitz, Babbott, et al., 2001; Swing, 2002; Brasel, Bragg, et al., 2004; Papadakis, Hodgson, et al., 2004)
  - Participant and student evaluations and satisfaction ratings (Irby, Rakestraw, 1981; Davidson, Vega, et al., 1996; Whiteside, Pope, et al., 1997)
  - Program, residency, and fellowship completion rates (Wax, Donovan, 2000)
  - Examinations, grades, scores, and achievement tests (Elnicki, Halbritter, et al., 1999)
  - Student performance in standardized patient examinations (Haist, Griffith, et al., 2004)
  - Peer review ratings (Thomas, Gebo, et al., 1999)
  - Patient care provided by learner outcomes (Brook, Fink, et al., 1987; Norcini, Blank, et al., 1995; Evans, Rogers, et al., 1996; Wong, Hollenberg, et al., 1999)
  - Clinical productivity (Anderson, Stritter, et al., 1997; Taylor, Friedman, et al., 2001)
- Curricular. Curricular outcomes include those related to teaching methods, use of innovative curricula, and courses. Examples of curricular outcomes include:
  - Implementation of innovative curricula (Bowen, Stearns, et al., 1997; Kurth, Irigoyen, et al., 2000)
  - Currency and relevancy of curricular topics (Bowen, Stearns, et al., 1997; Kurth, Irigoyen, et al., 2000)
  - Teaching methods and use of structured or other teaching evaluations (Prislin, Fitzpatrick, et al., 1998; Zayas, James, et al., 1999)
  - Opportunities for on-site learning and feedback, and monitoring of student learning activities (-Whiteside, Mathias, 1996; Whiteside, Pope, et al., 1997)
  - Provision of multicultural curricula and cultural competence curricula (Pena, Munoz, et al., 2003)
- Institutional. Institutional outcomes include those related to schools and faculty. This outcome could include measures such as faculty in leadership positions. Examples of institutional outcomes include:
  - Growth in number of schools with accredited family medicine programs (Politzer, Hardwick, et al., 1999)

- Increase in number of primary care and family medicine residency slots (Whitcomb, Cullen, et al., 1992; Rabinowitz, Diamond, et al., 1999; Pugno, Schmittling, et al., 2000; Campos-Outcalt, Senf, et al., 2004; Phillips, Starfield, 2004)
- Growth in number of programs promoting primary care training and service in underserved areas (Ricketts, Hart, 2001; Campos-Outcalt, Senf, et al., 2004)
- Rotations in primary care slots or rural residencies (Norris, Acosta, 1997; Easterbrook, Godwin, et al., 1999; Pathman, Steiner, et al., 1999; Geyman, Hart, et al., 2000; Rosenthal, 2000; Rosenblatt, Schneeweiss, et al., 2002)
- Implementation of targeted selection and preferential admission of students likely to enter primary care or serve in underserved areas, as well as demographics of these students (Rosenthal, Rabinowitz, et al., 1996; Fryer, Stine, et al., 1997; Xu, Fields, et al., 1997; Shi, Samuels, et al., 1998; Easterbrook, Godwin, et al., 1999; Hart, 2001; Rabinowitz, Paynter, 2000; Grumbach, Coffman, et al., 2002)
- Growth in number of qualified teachers (Irby, 1995; Zayas, James, et al., 1999; Heidenreich, Lye, et al., 2000)
- Growth of faculty in leadership positions (-Rabinowitz, Babbott, et al., 2001)
- Increase in learner satisfaction with the training program (Keitz, Holland, et al., 2003)

#### *WORKFORCE-RELATED OUTCOMES*

In order to identify candidate outcomes and measures for the workforce outcomes linked to education and training, the Committee further categorized the workforce-related outcomes identified in the literature into three subgroups: Supply, Diversity, and Distribution. Examples of outcome measures identified in these groups are provided below:

- **Supply.** Supply outcomes include those related to numbers of learners, graduates, or providers. Examples of supply outcomes include:
  - Increased match rates for primary care specialties (Phillips, Starfield, 2004; Whitcomb, Cohen, 2004)
  - Increased percentage of graduates entering in and graduating from primary care medical disciplines (Whitcomb, Cullen, et al., 1992; Campos-Outcalt, Senf, et al., 2004; Phillips, Starfield, 2004)
  - Increased supply of primary care providers (Lurie, Goodman, et al., 2002; Meyers, Fryer, et al., 2002)
  - Retention of program graduates in underserved areas (Rosenblatt, Saunders, et al., 1996)
- **Diversity.** Diversity outcomes include those related to the demographics of learners, graduates, or providers. Examples of diversity outcomes include:
  - Increased supply of female and minority providers (Ellsbury, Doescher, et al., 2000)
  - Increased number of women and minorities practicing as generalists (Council on Graduate Medical Education, 1998)
  - Increased number of women practicing in rural areas (Doescher, Ellsbury, et al., 2000; Ellsbury, Baldwin, et al., 2002)
  - Demographics of students (Xu, Fields, et al., 1997; Shi, Samuels, et al., 1998; Grumbach, Coffman, et al., 2002)
- **Distribution.** Distribution outcomes include those related to placement of learners, graduates, or providers. Examples of distribution outcomes include:
  - Increased number of providers practicing in HPSAs (Chan, Hart, et al., 2004)

- Increased number of providers practicing in underserved areas, rural areas, and inner cities as generalists (Komaromy, Grumbach, et al., 1996; Pathman, Williams, et al., 1996)
- Increased number of providers practicing in rural areas (Easterbrook, Godwin, et al., 1999)
- Increased number of providers practicing in underserved areas (Fink, Phillips, et al., 2003)
- Decreased level of need of patients and communities in underserved areas (Pathman, Konrad, et al., 2004)

#### *HEALTHCARE-RELATED OUTCOMES*

As discussed earlier, Title VII, section 747 programs are designed primarily to bring about education and training outcomes. Therefore, the Committee’s evaluation methodology efforts were focused primarily on education and training outcomes. However, the literature search yielded a small number of articles that linked healthcare-related outcomes to education and training. There are a number of challenges in examining the relationship between training and healthcare outcomes, including the latency of educational effect, individual variations, and the difficulty of controlling for any educational intervention (Chen, Bacuhner, et al., 2004). In addition, comparisons of clinical practice across different sites and healthcare systems are difficult to draw because they require relatively complex research designs or statistical techniques to adjust for variations in case mix among patient populations (Peabody, Luck, et al., 2004). Such confounders potentially dilute the ability to measure these outcomes. Given these considerations, two articles by Phillips, Starfield (2004), and Lishner, Rosenblatt, et al. (2000), for example, suggested correlations between primary care training and decreased mortality, reduced use of emergency departments, and better preventive care and screening.

#### *Description and Method for Reading the Logic Model*

A program logic model is a tool that provides a simplified visual representation of how a program or project is expected to work to achieve intended results (Schiller, 2004). According to the W.K. Kellogg Foundation, a program logic model links outcomes (both near- and longer-term) with program activities and processes as well as the theoretical assumptions and principles of the program (W.K. Kellogg Foundation, 2001). The process of developing a logic model is an opportunity for charting the course of planning, design, implementation, analysis, and knowledge generation for a program. Logic modeling can greatly enhance the participatory role and usefulness of evaluation as a management and learning tool.

Several types of logic models can be used to represent how a program accomplishes its objectives. These include Theory Approach Models, Outcomes Approach Models, and Activities Approach Models. For the Committee’s objectives, the Outcomes Approach Model was deemed the most appropriate. Outcomes Approach Models focus on program planning and identification of near-term (1–3 years) and longer-term (4–6 years) outcomes.

When read from left to right, the logic model describes how the program achieves results from the planning stage to outcomes. Reading a logic model means following the chain of reasoning of “*if...then...*” statements that connect the program’s parts (W.K. Kellogg Foundation, 2001).

When read from left to right, the major components of this type of logic model are:

- **Inputs.** These are resources (or barriers) that enable (or limit) program effectiveness or output. Resources may include funding, existing organizations, collaborating partners, staff, time, infrastructure, and others. Barriers may include regulations, geography, attitudes, or other limiting factors.
- **Activities.** These are processes, operations, and actions of the planned programs.
- **Outputs.** These are the direct results of program activities. They are usually described in terms of the size or scope, or both, of the services and products delivered or produced by the program.

- Outcomes. These are the impacts on intended beneficiaries. They may include specific changes in attitudes, behaviors, knowledge, skills, or level of function.

Appendix B, page 31, provides two illustrative examples of how to read the logic model. In describing the logic model for Title VII, section 747 programs, it is important to distinguish between program outputs and outcomes. Outputs represent the direct result of program operations and activities. An example of an output would include the grants administered by the Title VII, section 747 programs. Outcomes are the impacts on the intended beneficiaries resulting from the outputs. Examples of outcomes include training innovations or increased faculty competencies resulting from a grant.

The impact of outputs is more under the direct control of program managers, whereas realization of the outcomes will depend not only on the achievement of outputs, but also on the validity of the program's logic model (whether the program's outputs actually lead to the desired outcomes) and a set of exogenous factors. The logic model facilitated the Committee's identification of near- and longer-term measures associated with program objectives.

The Committee then identified inputs, activities, and outputs necessary to bring about these near- and longer-term outcomes.

The chart (Figure 5) on the next page sets out the Committee's Program Logic Model for Title VII, section 747 programs.

For each near- and longer-term outcome, the chart shown above indicates which of the seven key objectives, provided in the section entitled Objectives of Title VII, Section 747 Programs, page 2, are supported by the outcome. For example, Objective 5 is *Identify, develop, and disseminate primary care education and training innovations and best practices among programs, accrediting bodies, and other constituents*. A near-term outcome is Recommendations on policy or National guidelines. (O5 indicates Objective 5 in the chart). A longer-term outcome is *Adoption of innovations and best practices by others*.

#### *Review of BHPPr Objectives*

The third step in the Committee's process to develop scientifically sound and programmatically relevant measures was to review BHPPr's goals and Title VII, section 747's role in achieving those goals. BHPPr is in the process of refining performance measures to evaluate progress on the Bureau's goals. To help ensure alignment between BHPPr's goals and Title VII, section 747 activities, the Committee took into consideration BHPPr's goals and associated measures in identifying the Title VII, section 747 measures. In addition to program--specific measures, which are designed to capture unique accomplishments of each of BHPPr's programs, BHPPr is refining a set of five core measure areas, which are designed to capture accomplishments across five common purposes at the Bureau level. These broader measures, which use aggregated program data, include:

- Diversity. Increase health workforce diversity.
- Primary care. Promote careers in primary care.
- Distribution. Improve the distribution of the healthcare workforce.
- Quality. Improve the quality of care.
- Infrastructure. Strengthen public health and healthcare infrastructure.

In addition, BHPPr is refining a set of National outcome measures, which relate to ultimate healthcare outcomes, including access to primary care and health status. The Title VII, section 747 programs contribute directly to medical and dental education and training outcomes and, through these outcomes, contribute to BHPPr's core measures and National healthcare outcome goals as depicted in the figure below.

The Committee's objective was to identify medical and dental education and training outcome measures that were consistent with BHP's goals and measures. Appendix C, page 37, provides a summary of BHP's common purposes and associated core measures including a discussion of the consonance of these common purposes with the Title VII, section 747 objectives.

## **Recommended Outcome Measures**

On the basis of the literature review, the Program's logic model, and the review of BHP's goals and objectives, the Committee identified a list of candidate outcome measures. In order to prioritize measures in the candidate list and develop a set of recommended measures, the Committee established criteria for identifying the most appropriate measures. These criteria included:

1. The likelihood exists for obtaining accurate and reliable data for the measure at reasonable cost. This criterion is especially important because evaluation burden on grantees can have a significant impact on program viability.
2. The measure facilitates aggregation with other BHP measures. This criterion helps ensure the ability to demonstrate the relevance of Title VII, section 747 programs in the context of the Bureau's measures.
3. The measure is resistant to goal displacement. It is important that the measure not become the focus of program operations at the expense of other key objectives of Title VII, section 747.
4. The measure enables comparison over time to assess the degree of performance improvement.
5. The measure facilitates aggregation among the Title VII, section 747 program areas, supporting a comprehensive, integrated view of the programs.-
6. The measure reflects an evaluation method relevant to the needs of OMB and HRSA's BHP.
7. The measure facilitates easy assessment of performance relative to targets.

The Committee then applied these criteria to the set of candidate outcome measures to develop a list of recommended outcome measures for each objective. The recommended measures are provided in the chart (Figure 7) on the following page. These measures reflect the direct impact of Title VII, section 747 programs. In addition, these programs bring about other indirect impacts through their complementary relationships with other BHP programs, as discussed in the section entitled *Title VII, Section 747's Influence on the Workforce*, page 3. In evaluating the impact of its portfolio of programs, BHP should consider the synergy in these complementary relationships by identifying indicators that evaluate the synergy between Title VII, section 747 programs and other BHP programs, especially the NHSC, as well as HCOP, AHECs, and Rural Interdisciplinary Training.

These outcome measures are described in Appendix D, Description of Measures, page 41.

## **Evaluation Methodology**

This section presents an overall methodology for applying the measures discussed in the section entitled *Recommended Outcome Measures*, page 15. A well-constructed evaluation provides a rich set of data that not only can provide meaningful insights into program impact, but also can advance knowledge about education and training principles and approaches (see Figure 8 on page 18).

### *Develop Definitions for Outcome Measures*

Developing appropriate definitions for measures is an important step for ensuring meaningful evaluation of the programs. Many of these definitions will be obvious and non-contentious. Some, however, will require careful

consideration of Program and BHPPr objectives. For example, definitions for measurement parameters such as “underserved” communities must be established to reflect Program and BHPPr objectives. If Dental–HPSAs (D-HPSAs) were adopted as the definition for “underserved” communities with respect to dental care, and a State fails to designate adequately all potential D-HPSAs, then Title VII, section 747-trained pediatric dentists who locate in qualifying, but undesignated, communities will not be recognized.

In addition, some of the measures identified in the section entitled *Recommended Outcome Measures*, page 15, can effectively express the impact of the outcome in purely quantitative terms. For example, the measure: “*Learners who are from disadvantaged backgrounds, who are from rural backgrounds, or who are underrepresented minorities or women*” can be expressed in simple quantitative terms, and longitudinal comparisons are meaningful. However, the measure: “*Innovations, including use of new technology and best practices developed and adopted by accrediting bodies and others*” may have little significance in purely quantitative terms. To convey the programs’ impact with regard to this measure’s outcome, it may be necessary to develop a qualitative assessment of the impact of the innovations and best practices.

### *Develop Data Collection Procedures*

The next step in evaluation methodology is to develop data collection procedures. Data can come from a variety of sources, including HRSA’s BHPPr records, grantee applications, tests, surveys, or other data collection instruments. In some cases, there will be existing instruments that can be used. However, some new data collection instruments may need to be developed. It is important to ensure that the -reporting burden imposed on grantees is not excessive. Most grantees do not have significant resources for reporting, and as discussed earlier, Title VII, section 747 grants are typically a small portion of their overall program funding.

Some measures may be derived using a statistically significant sample rather than collecting data from all grantees or beneficiaries. For example, a measure such as: “*Graduates caring for underserved, uninsured, or special needs populations*” may be derived through sampling instead of collecting data from all grantees.

All data collection procedures require establishment of quality assurance protocols. Such protocols can include procedures to ensure reliability through uniform data collection and careful decisions about sampling strategies to ensure against bias.

### *Develop Data Analysis Procedures*

The goal of developing data analysis procedures is to make the most effective use of the outcome measures. Establishing baselines, targets, and identifying what kinds of comparisons are most meaningful will be important evaluation efforts. Many of the recommended measures lend themselves to making comparisons over time and developing trend analysis. For example, the measures: “*Ambulatory and community-based training sites that serve primarily underserved populations*” and “*Graduates caring for underserved, uninsured, or special needs populations*” can be followed serially over time. It will also be useful to make comparisons among grantees. Such comparisons can help to identify best practices or innovations.

### *Develop a Reporting Approach*

The outcome measures identified in the section entitled *Recommended Outcome Measures*, page 15, will provide a solid foundation for evaluating the impact of Title VII, section 747 programs. The goal of the reporting approach is to provide effective communication of program impact to constituents and stakeholders. In order to be effective, reporting mechanisms should express the results in terms relevant and understandable to the audience.

## Summary

The systematic evaluation of outcomes is critical to ensuring the effectiveness of Title VII, section 747 programs. However, establishing and sustaining effective evaluation methods is labor-intensive and expensive. Therefore, additional funds are necessary to develop an ongoing process for data collection, analysis, and reporting of program outcome measures. Grantees have few resources for data collection and analysis. It should be noted that any plan to reassign funds from current Program allocations would strongly compromise this process and jeopardize the intended outcomes of these programs.

## CONCLUSIONS

Historically, evaluations of Title VII, section 747 programs have not always been based on consistent Program outcomes and measures. In some cases, the use of different outcomes and measures leads to conflicting findings regarding the impact of these programs. Adoption of a consistent set of outcomes and measures, based on Program objectives, is a critical step in ensuring that programs deliver intended benefits to stakeholders and constituents. The Committee believes that adoption of the outcomes and measures recommended herein not only will facilitate more meaningful evaluation of Program impact, but also will foster continuous program improvement.

## RECOMMENDATIONS

Consistent with the stated purpose:

*To educate and train physicians, pediatric and general dentists, and physician assistants to enhance the quality, capacity, and diversity of the Nation's primary care workforce, giving special consideration to the healthcare needs of underserved populations and other high-risk groups.*

The Advisory Committee on Training in Primary Care Medicine and Dentistry (ACTPCMD) recommends that:

1. The outcome measures utilized to evaluate Title VII, section 747 programs should reflect the Program's statutory focus on health professional education and training. Evaluation of this Program should focus on preparation of the primary care workforce. External evaluations of the Program should be designed to specifically capture educationally oriented outcomes. Meaningful evaluation should include quantitative and qualitative methods that address quality, capacity, and diversity. Outcome measures should encompass physician assistant training, pre-doctoral training, academic administrative units, primary care residency training, primary care faculty development, and general and pediatric dental residency training.
2. The proposed logic model and near- and longer-term outcome measures should guide the evaluation of Title VII, section 747 programs. Title VII, section 747 programs are diverse and have a variety of both near- and longer-term benefits for learners (students, residents, and faculty) and the populations served. Analysis, interpretation, and presentation of data should address various outcome measures as outlined in the report. The proposed logic model demonstrates the complex, multi-factorial set of interrelationships and influences on Program outcomes (see section entitled *Description and Method for Reading the Logic Model*, page 13) and provides a framework to identify and select programmatically relevant outcome measures.
3. Outcome measures should be identified that evaluate the synergistic role of Title VII, section 747 programs with other Bureau of Health Professions (BHP) programs, especially the National Health Service Corps (NHSC), as well as Health Careers Opportunity Program (HCOP), Area Health Education Centers (AHECs), and Rural Interdisciplinary Training. Evaluation of these programs should primarily focus on the preparation, education, and training of the primary care workforce. Evaluation should include the synergism between Title VII, section 747 and other BHP programs such as HCOP, AHECs, and Rural Interdisciplinary Training. Although

placement of program graduates in underserved settings is not a principal focus of Title VII, section 747 programs, it strongly impacts the preparation of healthcare professionals to assume roles for other BHPr programs. Evaluation could include how these programs have properly trained professionals to serve in underserved settings and in programs like the NHSC and community, migrant, and rural health centers, as well as to care for underserved populations and high-risk groups.

4. BHPr should develop procedures for data collection, analysis, and reporting of Program outcome measures. BHPr should oversee the process of collecting, analyzing, and reporting qualitative and quantitative data associated with outcomes. These outcome measures should be developed and implemented consistent with the logic model, objectives, and near- and longer-term outcomes presented in this report. The process developed must provide meaningful reporting on Program effectiveness without placing undue burden on grantees for collecting data.
5. Additional financial resources should be made available to BHPr to implement effective evaluation processes for the programs in Title VII, section 747. The systematic evaluation of outcomes is critical to ensuring the effectiveness of Title VII, section 747 programs. However, establishing and sustaining effective evaluation methods is labor-intensive and expensive. Therefore, additional funds are necessary to develop an ongoing process for data collection, analysis, and reporting of program outcome measures. It should be noted that any plan to reassign funds from current Program allocations would strongly compromise this process and jeopardize the intended outcomes of these programs.

Figure text for main body-----

### **Figure 3. Title VII, Section 747 Strategic Framework**

***Purpose: To educate and train physicians, pediatric and general dentists, and physician assistants to enhance the quality, capacity, and diversity of the Nation’s primary care workforce, giving special consideration to the healthcare needs of underserved populations and other high-risk groups.***

#### **STAKEHOLDERS**

- White House/OMB
- Congress
- U.S. Dept. of Health and Human Services
- Taxpayers/Public

Improve Health Outcomes of the Nation  
 Advance U.S. DHHS Primary Care Workforce Goals  
 Evaluate Impact of Title VII, Section 747 Programs  
 Improve the Nation’s Primary Care Training Quality and Capacity  
 Advise Primary Care Workforce Policy  
 Disseminate Primary Care Delivery Innovations

#### **CONSTITUENTS**

- Institutions <sup>1</sup>
- Learners <sup>2</sup>

Improve Primary Care Education and Training  
 Serve as Change Agent  
 Grant Program Areas  
   Dental Residency  
   Physician Assistant  
   Academic Administrative  
   Faculty Development  
   Pre-doctoral



Primary Care Residency  
 Develop Training Innovations  
 Evaluate Innovations  
 Disseminate/Replicate Innovations  
 National Curricula and Training Programs

**OPERATIONS**

Operate Grant Programs  
 Develop Program Policy  
 Develop Partnerships  
 Manage Co-op and Collaborative Agreements and Contracts

<sup>1</sup> Institutions include departments, divisions, and programs.

<sup>2</sup> Learners include students, residents, and faculty.

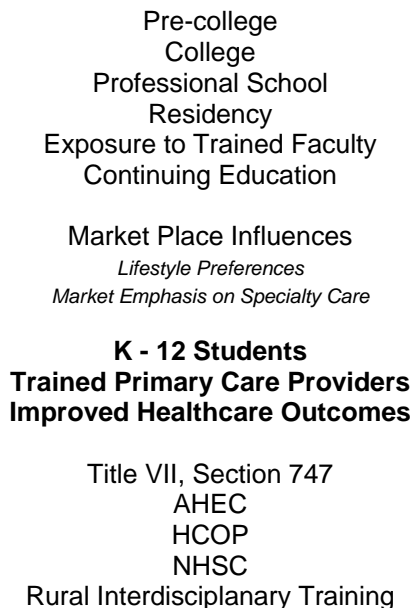
**Key Objectives**

**Stakeholders Constituents**

1. Improve the quality of education and training of the Nation's primary care workforce. ....  
 .....
2. Improve the capacity for education and training of the Nation's primary care workforce, with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.
3. Improve primary care education and training curricula. ....  
 .....
4. Improve primary care faculty development. ....  
 .....
5. Identify, develop, and disseminate primary care education and training innovations and best practices among programs, accrediting bodies, and other constituents... ..  
 .....
6. Improve the preparation of faculty, residents, and students (or learners) to work with medically and dentally underserved populations and build linkages to communities... ..  
 .....
7. Improve the diversity and number of primary care faculty and students (or learners), with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities...

Important  
 Very Important

**Figure 4. Primary Care Education and Training Pipeline**



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## Figure 5. Title VII, Section 747 Logic Model

*Inputs*  
*Activities*  
*Outputs*  
*Near-Term Outcomes*  
*Longer-Term Outcomes*

Title VII, section 747 legislative authority  
Title VII, section 747 funding  
DHHS and BHPi infrastructure

Education and training grant management  
Operation of contracts and co-op and collaborative agreements

Education and training grants, faculty development, and curricular innovations  
Cost-effective management of funding mechanisms  
Timely approvals, disbursements, and receipt of grantee submissions

O1: Improved primary care education and training curricula  
O6: Increased ability of learner and faculty to serve high-risk, special needs, and vulnerable populations  
O2: Improved primary care training capacity  
O7: Increased diversity of primary care faculty, residents, and students  
O3: Increased training in underserved communities

O1: Improved primary care workforce training and quality  
O2: Improved capacity of primary care training infrastructure  
O7: Improved diversity of graduates (including underrepresented minorities)  
O3: Increased primary care providers serving high-risk and underserved populations  
O1: Goals met from *Healthy People 2010*

ACTPCMD  
COGME  
Public and private partnerships

Partnership development  
Primary care research and policy development

Partnerships  
Workforce studies and training research  
Annual reports – research results and recommendations  
Feedback and consensus  
Performance indicators/baseline performance data

O4: Published primary care training and primary care research in priority areas  
O5: Recommendations on policy or National guidelines  
O5: Dissemination of innovations and best practices

O5: Adoption of innovations and best practices by others

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## Figure 6. Hierarchy of BHPi Outcomes

### Health Care Outcomes

### Workforce Outcomes

Supply  
Diversity  
Distribution

### Medical/Dental Education Outcomes

Curricula  
Faculty  
Institutions <sup>1</sup>  
Learners <sup>2</sup>

## **Title VII, Section 747, 748 Programmatic Outputs**

Primary Care Research and Policy Development

Partnerships

Grant Operations and Management

Contract Management

<sup>1</sup> Institutional outcomes include those related to departments, divisions, and programs.

<sup>2</sup> Learner outcomes include those related to students, residents, and faculty.

-----

### **Figure 7. Recommended Outcome Measures**

#### **Key Objectives**

*Near-Term Measures*  
*Longer-Term Measures*

#### **1. Improve the quality of education and training of the Nation's primary care workforce.**

- Evidence of competency of learners and faculty, as demonstrated by improvement in knowledge, skills, attitudes, etc.
- Goals met from *Healthy People 2010*

#### **2. Improve the capacity for education and training of the Nation's primary care workforce (with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities).**

- Learners and faculty trained
- Retention in primary care
- Primary care training programs created, expanded, or affected as a result of Title VII, section 747 funding

#### **3. Improve primary care education and training curricula.**

- Grantees implementing curricula addressing critical healthcare needs as defined in the Title VII, section 747 Guidance
- Hours devoted to curriculum (can include training for culturally effective care)
- Grantees with rural and/or underserved populations training tracks, clinical rotations, etc.
- Programs that address emerging health care needs
- Graduates whose practice focuses on a specific underserved population or on a specific primary care problem

#### **4. Improve primary care faculty development.**

- Leadership roles and scholarly output of primary care faculty, as demonstrated by promotion and tenure, presentations and publications, research grants, advocacy, and public and professional service
- Primary care faculty in medical or dental educational institutions over a timeframe
- Primary care trained graduates in faculty positions

#### **5. Identify, develop, and disseminate primary care education and training innovations and best practices among**

**programs, accrediting bodies, and other constituents.**

- Primary care education and training publications and research publications, including web-based publications
- Innovations, including use of new technology and best practices developed and adopted by accrediting bodies and others

**6. Improve the preparation of faculty, residents and students (or learners) to work with medically and dentally underserved populations and build linkages to communities.**

- Ambulatory and community-based training sites that serve primarily underserved populations
- Learners who are from disadvantaged backgrounds, who are from rural backgrounds, or who are underrepresented minorities or women
- Disadvantaged, high-risk, and special needs individuals served
- Graduates caring for underserved, uninsured, or special needs populations
- Where graduates practice

**7. Improve the diversity and number of primary care faculty and students (or learners), with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.**

- Learners who are from disadvantaged backgrounds, who are from rural backgrounds, or who are underrepresented minorities or women
- Learners among funded programs who indicate at matriculation and graduation that they intend to work in primary care
- Underrepresented minority faculty who have completed Title VII, section 747 faculty development programs, and who teach and/or serve underserved populations
- Underrepresented minority faculty involved in leadership or research positions
- Faculty, graduates, and practitioners trained in funded programs who are from disadvantaged backgrounds or who are underrepresented minorities or women

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**Figure 8. Evaluation Methodology**

**Develop Definitions for Outcomes Measured**

- Align definitions with BHP objectives and measures.
- Identify units of analysis and whether definitions are qualitative or quantitative.

**Develop Data Collection Procedures**

- Design data collection instruments.
- Establish collection procedures to minimize burden of response on grantees.
- Establish sampling approach.
- Determine which data are required and which data are optional.
- Establish quality assurance protocols.

**Develop Data Analysis Procedures**

- Design analysis.
- Establish baselines or standards.
- Identify bases of comparison.

**Develop Reporting Approach**

- Identify evaluation report audience.
- Design report content and format, and establish reporting frequency.

**Evaluation Methodology**

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# APPENDICES

## APPENDIX A – KEY ACRONYMS

Key acronyms used in the report include:

- ACTPCMD – Advisory Committee on Training in Primary Care Medicine and -Dentistry
- AHEC – Area Health Education Center
- BHPr – Bureau of Health Professions
- COGME – Council on Graduate Medical Education
- DHHS – U.S. Department of Health and Human Services

- D-HPSA – Dental Health Professional Shortage Area
- HCOP – Health Careers Opportunity Program
- HPSA – Health Professional Shortage Area
- HRSA – Health Resources and Services Administration
- MUC – Medically Underserved Community
- NHSC – National Health Service Corps
- OMB – Office of Management and Budget
- OSCE – Objective Structured Clinical Examinations
- PART – OMB’s Program Assessment Rating Tool
- PCSA – Primary Care Service Area
- UME-21 – Undergraduate Medical Education for the 21st Century

## APPENDIX B – EXAMPLES OF HOW TO READ THE LOGIC MODEL

Appendix B provides two simple examples (starting on the next page) that illustrate how to read logic models. The first example illustrates a funding scenario. The second illustrates the impact of Advisory Committee recommendations.

### **Funding**

Funding levels influence the near- and longer-term outcomes of the Program. The shaded boxes in the logic model (Figure 9) on the next page illustrate how funding impacts factors such as the size and number of grants, which in turn impact the Program outcomes. When the logic model is read from left to right, it illustrates how funding contributes to the Program’s activities, outputs, and outcomes.

- **Input.** Title VII, section 747 funding is one of the inputs needed to operate the Program.
- **Activities.** The level of funding determines the level of activity such as education and training grants; operation of contracts, co-operative agreements, and collaborative agreements; partnership development; and primary care research and policy development. For example, more funding would allow for larger grants, less funding would require smaller grants.
- **Outputs.** The level of activity will in turn determine the amount of service delivered. The services include education and training grants and associated curricular innovations, partnerships, workforce studies, and annual reports.
- **Near-term outcomes.** The level of these services delivered will determine the level of outcomes for intended beneficiaries. The outcomes include improved primary care education and training curricula, increased ability of learner and faculty to serve, and improved primary care training capacity.
- **Longer-term outcomes.** These outcomes then provide long-term benefit to stakeholders and constituents. These

outcomes include improved primary care workforce training and capacity, improved primary care training infrastructure, and improved diversity of graduates.

## Impact of ACTPCMD Recommendations

The Committee’s recommendations influence the Program’s focus and priorities and thereby impact the types of innovations brought about by the Program. Adoption of these innovations helps to bring about the near- and longer-term outcomes of the Program. The shaded boxes in the logic model (Figure 10), depicted on the next page, when read from left to right, illustrate how the Committee’s recommendations contribute to the Program’s activities, outputs, and outcomes.

- **Input.** The ACTPCMD is one of the Program inputs. The Committee has a statutory obligation to make recommendations to the Congress and the Secretary of DHHS.
- **Activities.** A key Committee activity is primary care research resulting in policy development recommendations. For example, this year the Committee is developing policy recommendations on Program evaluation.
- **Outputs.** These policy recommendations are key to an annual report developed by the Committee.
- **Near-term outcomes.** The report makes a case for recommendations set out therein. In the case of this report, recommendations are made regarding policy for Program evaluation.
- **Longer-term outcomes.** Adoption of Program evaluation recommendations will not only enable policymakers to make better decisions about National healthcare policy, but will also facilitate continuous program improvement that will in turn enable improved primary care workforce education and training quality, improved capacity of training primary care infrastructure, and improved diversity of graduates.

Figure text for Appendix B-----

### Figure 9. Logic Model – Funding Example

*Inputs*  
*Activities*  
*Outputs*  
*Near-Term Outcomes*  
*Longer-Term Outcomes*

Title VII, section 747 legislative authority  
**Title VII, section 747 funding**  
DHHS and BHPi infrastructure

**Education and training grant management**  
**Operation of contracts and co-op and collaborative agreements**

**Education and training grants, faculty development, and curricular innovations**  
Cost-effective management of funding mechanisms  
Timely approvals, disbursements, and receipt of grantee submissions

**O1: Improved primary care education and training curricula**  
**O6: Increased ability of learner and faculty to serve high-risk, special needs, and vulnerable populations**  
**O2: Improved primary care training capacity**  
**O7: Increased diversity of primary care faculty, residents, and students**  
**O3: Increased training in underserved communities**

**O1: Improved primary care workforce training and quality**  
**O2: Improved capacity of primary care training infrastructure**

- O7: Improved diversity of graduates (including underrepresented minorities)**
- O3: Increased primary care providers serving high-risk and underserved populations**
- O1: Goals met from *Healthy People 2010***

ACTPCMD  
 COGME  
 Public and private partnerships

**Partnership development**  
**Primary care research and policy development**

**Partnerships**  
**Workforce studies and training research**  
**Annual reports – research results and recommendations**  
**Feedback and consensus**  
**Performance indicators/baseline performance data**

- O4: Published primary care training and primary care research in priority areas**
- O5: Recommendations on policy or National guidelines**
- O5: Dissemination of innovations and best practices**

O5: Adoption of innovations and best practices by others

-----  
**Figure 10. Logic Model – ACTPCMD Recommendation Example**

*Inputs*  
*Activities*  
*Outputs*  
*Near-Term Outcomes*  
*Longer-Term Outcomes*

Title VII, section 747 legislative authority  
 Title VII, section 747 funding  
 DHHS and BHP infrastructure

Education and training grant management  
 Operation of contracts and co-op and collaborative agreements

Education and training grants, faculty development, and curricular innovations  
 Cost-effective management of funding mechanisms  
 Timely approvals, disbursements, and receipt of grantee submissions

- O1: Improved primary care education and training curricula
- O6: Increased ability of learner and faculty to serve high-risk, special needs, and vulnerable populations
- O2: Improved primary care training capacity
- O7: Increased diversity of primary care faculty, residents, and students
- O3: Increased training in underserved communities

- O1: Improved primary care workforce training and quality**
- O2: Improved capacity of primary care training infrastructure**
- O7: Improved diversity of graduates (including underrepresented minorities)**
- O3: Increased primary care providers serving high-risk and underserved populations**
- O1: Goals met from *Healthy People 2010***

**ACTPCMD**  
 COGME  
 Public and private partnerships

**Partnership development**  
**Primary care research and policy development**

**Partnerships**  
**Workforce studies and training research**  
**Annual reports – research results and recommendations**  
**Feedback and consensus**  
**Performance indicators/baseline performance data**

- O4: Published primary care training and primary care research in priority areas

**O5: Recommendations on policy or National guidelines**  
O5: Dissemination of innovations and best practices

**O5: Adoption of innovations and best practices by others**

## APPENDIX C – BHP<sub>r</sub> CONCEPTUAL FRAMEWORK AND CORE PERFORMANCE MEASURES

The Bureau of Health Professions’ conceptual framework, depicted in Figure 11 on the next page, illustrates the relationship between its approximately 40 programs, the five common purposes of those programs, and the short-term, long-term, and ultimate outcomes of the Bureau’s program portfolio. The ultimate outcomes support various *Healthy People 2010* goals. The purpose and objectives of Title VII, section 747 programs, as described in this report, are consonant with the common purposes and support the outcomes set out in the Bureau’s conceptual framework. Title VII, section 747 programs contribute directly to medical and dental education and training outcomes and, through these outcomes, contribute to BHP<sub>r</sub>’s common purposes and associated measures.

A summary of the Bureau-level core measures associated with the five common purpose areas is provided in Figure 12 on page 39. In addition, the figure identifies which of the seven Title VII, section 747 objectives identified in this report support each of the common purpose areas.

### **Title VII, Section 747 Objectives**

1. Improve the quality of education and training of the Nation’s primary care workforce.
2. Improve the capacity for education and training of the Nation’s primary care workforce, with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.
3. Improve primary care education and training -curricula.
4. Improve primary care faculty development.
5. Identify, develop, and disseminate primary care education and training innovations and best practices among programs, accrediting bodies, and other constituents.
6. Improve the preparation of faculty, residents, and students (or learners) to work with medically and dentally underserved populations and build linkages to communities.
7. Improve the diversity and number of primary care faculty and students (or learners), with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.

Figure text for Appendix C-----

### **Figure 11. BHP<sub>r</sub> Conceptual Framework**

**Largely Measurable**

**Programs**  
*Program Measures*  
**BHP<sub>r</sub> Programs<sup>1</sup>**

**Brief Description**  
*Common Purpose*  
**Short-Term Outcomes**  
*Bureau-Level Performance Measures*

**Increase the diversity of the health professional population.**

**Increased Workforce Diversity**

Matriculation and graduation rates for underrepresented minorities, and students from disadvantaged backgrounds; the proportion of minorities in the health professional workforce

**Encourage the selection of a primary care career.**

**Primary Care Career Choice**

Implementation of evidence-based strategies to promote careers in primary care, and the results of those strategies

**Improve the distribution of health professionals in the United States.**

**Improved Workforce Distribution**

Implementation of evidence-based strategies to improve workforce distribution, and the results of those strategies

**Improve the quality of care, through education and training.**

**Improved Workforce Quality**

The degree to which the Institute of Medicine's 2003 core competencies are integrated into BHPr education and training programs; institutional commitment to addressing cultural competence and health literacy

**Strengthen public health and health workforce infrastructure.**

**Improved Infrastructure for Health, Especially Primary Care Public Health**

Improve timeliness and accessibility of data; the degree to which specific competencies related to public health are addressed in BHPr Programs

**Less Measurable**

**Long-Term Outcome**

**Ultimate**

***National Outcome Measures***

**Improved Access to High-Quality Primary Care and Public Health Services**

e.g., % with a usual source of care, receipt of preventive services

**Reduced Morbidity**

**Reduced Mortality**

**Reduced Health Disparities**

e.g., decreased mortality due to selected causes, decreased hospitalizations for primary care sensitive conditions, and improved black/white and Hispanic/white ratios for selected conditions

<sup>1</sup> BHPr programs include Centers of Excellence Program; Faculty Loan Repayment Program; Health Professional Student Loan Program; Loans for Disadvantaged Students Program; Minority Faculty Fellowship Program; Nursing Student Loan Program; Primary Care Loan Program; Scholarships Disadvantaged Students Program; Children's Hospital Graduate Medical Education Payment Program; Dental Public Health Residency Program; Graduate Psychology Program; Training in Primary Care Medicine & Dentistry; National Research Service Award Program; Advanced Education Nursing Program; Comprehensive Geriatric Education Program-Nursing; Nursing Education Loan Repayment Program; Nursing Education, Practice, Retention Program; Nurse Faculty Loan Program; Nursing Workforce Diversity Program; National Health Service Corps Loan Repayment Program; Nursing Scholarship Program; National Health Service Corps Scholarship Program; Area Health Education Centers Program; Chiropractic Program; Public Health Traineeships Program; Public Health Training Center Program; Preventive Medicine Residency Program; State Loan Repayment Program; and Practitioner Databanks Programs.

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## Figure 12. Summary of BHPr Core Performance Measure

**Common Purpose**  
**Core Performance Measures**  
**Title VII, Section 747 Objective**

### Diversity

**Strategy: Increase health workforce diversity.**

- Percentage of underrepresented minorities matriculating in health professions education and training programs
  - Percentage of underrepresented minorities graduating from health professions education and training programs
  - Percentage of disadvantaged students matriculating in health professions education and training programs
  - Percentage of disadvantaged students graduating from health professions education and training programs
  - Percentage of underrepresented minorities among health professionals younger than age 35
- 2, 6, and 7

### Primary Care

**Strategy: Promote careers in primary care.**

- Degree to which Bureau-funded programs are implementing evidence-based strategies to promote selection of a primary care career among health professionals
  - Percent change in the number of residency and traineeship positions filled annually in primary care medicine and dentistry
  - Number of primary care health professionals as a percentage of all health professionals
- 1, 2, 3, 4, 5, 6, and 7

### Distribution

**Strategy: Improve the distribution of the primary care health workforce.**

- Degree to which Bureau-funded programs are implementing evidence-based strategies to positively influence the distribution of the health professional workforce
  - Level of disparity in the distribution of primary care physicians across Primary Care Service Areas (PCSAs) in the United States.
  - Percent of the population living in areas below a set population to primary care provider ratio
- 2, 3, 6, and 7

### Quality

**Strategy: Improve the quality of care.**

- Degree to which patient-centered care, health informatics, evidence-based decision-making, interdisciplinary team training, and quality measurement and improvement are integrated into BHPr-supported health professional education and training programs
  - Degree to which BHPr education/training grantees include cultural competence in their programs
  - Percentage of BHPR grantees whose organizations have an institutional policy addressing health literacy
- 1, 3, 4, 5, and 6

### Infrastructure

**Strategy: Strengthen public health and healthcare infrastructure.**

- Accessibility of BHPr-developed data and information resources vital to health workforce analysis
  - Degree to which Bureau-supported education and training programs contribute to the attainment of improved workforce competencies in population-based health
  - National average score on Essential Public Health Function: Human Resource Development and Training in Public Health
- 1, 2, 3, 4, 5, 6, and 7

## APPENDIX D – DESCRIPTION OF MEASURES

Appendix D provides descriptions of the 24 recommended measures. Although the recommended process for developing definitions for the measures is described in the section entitled *Develop Definitions for Outcome Measures*, page 16, this appendix provides guidelines and examples for consideration for each measure.

Objective 1: Improve the quality of education and training of the Nation’s primary care workforce.

1. Evidence of competency of learners and faculty, as demonstrated by improvement in knowledge, skills, attitudes, etc. A traditional way of measuring an educational intervention is to assess the extent to which learners have advanced their knowledge, skills, or attitudes as a result of the intervention. Evidence of increased learner and faculty competency in the primary healthcare training setting demonstrates improved quality of



education and training of the Nation's primary care workforce. There is a need for the establishment of valid and reliable measures of educational program quality and outcomes to evaluate educational effectiveness (Heidenrich, Lye, et al., 2000; Bordage, Burack, et al., 1998). Examples for this measure may include traditional tests, pre- and post-test comparisons of trainees, Objective-Structured Clinical Examinations (OSCEs), tracking of results of the American Academy of Pediatrics' Education in Quality Improvement for Pediatric Practice (eQIPP) Program, competency evaluations, surveys, and quasi-experiments.

2. Goals met from *Healthy People 2010*. Progress on the *Healthy People 2010* goals is an indicator of overall National health outcomes to which the Title VII, section 747 programs contribute. In particular, Title VII, section 747 programs can contribute to the goal of eliminating health disparities among different segments of the population. For this measure, progress on relevant *Healthy People 2010* goals should be evaluated. These *Healthy People 2010* goals may include an:

- Increase in the proportion of persons who have a specific source of ongoing care
- Increase in the proportion of persons with a usual primary care provider
- Increase in the proportion of schools of medicine, nursing, and health professional training schools whose basic curriculum for healthcare providers includes the core competencies in health promotion and disease prevention

Objective 2: Improve the capacity for education and training of the Nation's primary care workforce, with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.

3. Learners and faculty trained. Increasing capacity (e.g., more institutions and programs, faculty, training tracks, and clinical sites) for educating and training the Nation's primary care workforce enables an increase in the number of learners and faculty trained. Examples of this measure include number or percentage of primary care learners graduated and number or percentage of faculty trained.
4. Retention in primary care. Increases in the retention of providers in primary care settings will lead to increased supply of providers in primary care settings. Examples of this measure include length of time providers remain in primary care settings, number of providers who remain in primary care practice for a certain period of time, and percentage of primary care providers remaining in primary care settings for a certain period of time.
5. Primary care training programs created, expanded, or affected as a result of Title VII, section 747 funding. Politzer, Hardwick, and colleagues (1999), suggest that measures such as the number of family medicine departments influenced is a good indicator of Title VII, section 747's impact on capacity for training the primary care workforce. Examples of this measure include the number of training programs created in family practice, general pediatrics, general internal medicine, physician assistant, general dentistry, and pediatric dentistry.

Objective 3: Improve primary care education and training curricula.

6. Grantees implementing curricula addressing critical healthcare needs as defined in the Title VII, section 747 Guidance. An example of this measure is the number or percentage of grantees implementing curricula addressing critical healthcare needs as defined in the Title VII, section 747 Guidance.
7. Hours devoted to curriculum (can include training for culturally effective care). The time commitment as a measure of emphasis can be measured through hours spent on a given curriculum. Examples of this measure include the percentage of total hours (e.g., class time) spent on primary care curricula and training time for Title VII, section 747 residents relative to the time spent by all primary care residents.

8. Grantees with rural and/or underserved population training tracks, clinical rotations, etc. Campos-Outcalt, Senf, and colleagues (2004), indicate that an important factor in the increased production of primary care physicians is the adoption of a curriculum that maximizes clinical training with primary care physicians. They found a relationship between the number of family medicine clerkship sites to which students were exposed and the decision to practice family medicine. Meurer (1995) found that three types of curricular experiences may increase interest in primary care: third-year family medicine clerkships, continuity experiences in primary care settings, and primary care tracks. Direct experience working with rural or underserved populations through training tracks and clinical rotations improves the primary care curriculum by providing actual experiences that prepare physicians to serve those groups. Examples of this measure include the average number of family medicine clerkship sites to which students are exposed and the time spent in clinical rotations in primary care education.
9. Programs that address emerging healthcare needs. Emerging healthcare needs should be integrated into the primary care education and training curricula. Examples include bioterrorism preparedness, genomics, evidence-based guidelines, team-based care, use of technology, and use of data for quality improvement.
10. Graduates whose practice focuses on a specific underserved population or on a specific primary care problem. The long-term result of improved primary care education and training is an increase in graduates who are practicing primary care in primary care settings. Examples of this measure include the number or percentage of Title VII, section 747 graduates serving underserved populations relative to all primary care practitioners or number of medically compromised patients served (Atchison, Mito, et al., 2002).

#### Objective 4: Improve primary care faculty development.

11. Leadership roles and scholarly output of primary care faculty, as demonstrated by promotion and tenure, presentations and publications, research grants, advocacy, and public and professional service. Faculty productivity and leadership have been measured by teaching assessments, publication and dissemination of work, peer review, faculty in leadership positions (Rabinowitz, Babbott, et al., 2001), and community service. Examples of this measure include the number of primary care-related articles published, reports, and presentations delivered by funded faculty.
12. Primary care faculty in medical or dental educational institutions over a timeframe. The number of primary care faculty per year over a period of time is an indicator of change in education and training capacity. An example of this measure is growth in the number or percentage of primary care faculty at funded programs over a specific time period (e.g., 5 years). Another example is the number or percentage of primary care faculty at funded programs remaining in primary care teaching positions over a specific time period (e.g., 5 years).
13. Primary care trained graduates in faculty positions. The number of primary care graduates trained at funded institutions or programs who go on to take faculty positions in educational institutions is an indicator of Title VII, section 747 impact on education and training capacity resulting from faculty development. An example of this measure is the number or percentage of graduates from funded programs taking faculty positions.

#### Objective 5: Identify, develop, and disseminate primary care education and training -innovations and best practices among programs, accrediting bodies, and other -constituents.

14. Primary care education and training publications and primary care research publications, including web-based publications. To identify, develop, and disseminate innovations and best practices and their relative effectiveness, primary care education and training programs need to develop incentives. To benefit other programs, these best practices and innovations need to be shared with others who might adopt them through publications, presentations, web sites, and other vehicles. Examples of this measure include the number of

education- and training-related publications, including web-based publications, and a qualitative assessment by an expert panel or an independent organization of the impact of publications.

15. Innovations, including use of new technology and best practices developed and adopted by accrediting bodies and others. In order to yield maximum benefit from innovations and best practices, accrediting bodies must adopt them. Adoption by accrediting bodies is also an indicator of quality or potential benefit provided by these innovations and best practices. Examples of this measure include the qualitative assessment of impact of innovations and best practices adopted, assessment made by an expert panel, and number of innovations and best practices developed and adopted.

Objective 6: Improve the preparation of faculty, residents, and students (or learners) to work with medically and dentally underserved populations and build linkages to -communities.

16. Ambulatory and community-based training sites that serve primarily underserved populations. There is evidence that exposure to training sites that serve underserved populations increases the likelihood that graduates will go on to work in those communities (Norris, Acosta, 1997). Over three-quarters of rural training track graduates practice in rural areas and feel prepared for rural practice (Rosenthal, 2000). Physicians who are prepared to become rural doctors and are prepared for small-town living tend to stay longer in rural practices (Pathman, Steiner, et al., 1999). Examples of this measure include the average number of hours of exposure to training sites that serve underserved populations and the average number of sites to which students are exposed that serve underserved populations.
17. Learners who are from disadvantaged backgrounds, who are from rural backgrounds, or who are underrepresented minorities or women. Pathman, Williams, and colleagues (1996), found that NHSC minority physicians tended to work in counties and practices with a greater proportion of minority residents and patients. Cantor, Miles, et al. (1996), indicated that women and minority physicians are more likely to serve poor, minority, and Medicaid populations. Rabinowitz and Paynter (2000) and Easterbrook, Godwin, and colleagues (1999), report that targeted selection of students from rural backgrounds is effective in producing physicians who practice in rural areas. Komaromy, Grumbach, et al. (1996), found that black and Hispanic physicians were more likely to provide healthcare for underserved populations. An example of this measure includes the number or percentage of learners who are economically disadvantaged, who are from rural backgrounds, or who are underrepresented minorities or women. (This measure applies to both Objectives 6 and 7.)
18. Disadvantaged, high-risk, and special needs individuals served. In addition to educating and training the primary care workforce, Title VII, section 747 training sites provide significant health services to those populations. An example of this measure includes the number of disadvantaged, high-risk, and special needs individuals who are served by Program learners or graduates.
19. Graduates caring for underserved, uninsured, or special needs populations. The presence and retention of primary care providers caring for underserved populations (Rosenblatt, Saunders, et al., 1996) enhances access for individuals in those areas. The number of graduates caring for these populations is an indicator of direct impact on access. An example of this measure includes the number of graduates who are caring for the underserved, graduates who are caring for uninsured patients, and graduates who are caring for special needs populations. Further examples of this measure include the number of primary care providers working in underserved areas, retention rates for primary care providers in underserved areas, and the number of primary care providers caring for underserved individuals, including those with special healthcare needs, Medicaid, State Children's Health Insurance Program (SCHIP), and no insurance (pro-bono care).
20. Where graduates practice. Data from loan repayment programs, Association of American Medical Colleges (AAMC), American Academy of Family Physicians (AAFP), American Osteopathic Association (AOA),

American Association of Colleges of Osteopathic Medicine (AACOM), and other professional organizations can be used to identify where practitioners are located. Examples of this measure include geographic distribution of graduates and proportion practicing in underserved versus non-underserved areas.

Objective 7: Improve the diversity and number of primary care faculty and students (or learners), with special emphasis on individuals from disadvantaged backgrounds and underrepresented minorities.

17. Learners who are from disadvantaged backgrounds, who are from rural backgrounds, or who are underrepresented minorities or women. (This measure applies to both Objectives 6 and 7.)
21. Learners among funded programs who indicate at matriculation and graduation that they intend to work in primary care. Intention to serve at matriculation is a good indicator and valid measure of subsequent practice choice as a primary care provider. Examples of this measure include students indicating at matriculation their intention to practice primary care and students indicating at graduation their intention to practice primary care.
22. Underrepresented minority faculty who have completed Title VII, section 747 faculty development programs, and who teach and/or serve underserved populations. Examples of this measure include the number of Title VII, section 747 trained faculty who are from underrepresented groups and care for underserved populations or high-risk groups, and the number of Title VII, section 747 trained faculty who are engaged in primary care education and training.
23. Underrepresented minority faculty involved in leadership or research positions. Examples of this measure include the number of faculty from underrepresented groups who are involved in leadership positions, and the number of faculty from underrepresented groups who are involved in educational research, especially with regard to underserved populations.
24. Faculty, graduates, and practitioners trained in funded programs who are from disadvantaged backgrounds or are underrepresented minorities or are women. An example of this measure is the number or percentage of faculty, graduates, and practitioners who are underrepresented minorities, women, from disadvantaged backgrounds, or from rural or inner-city settings.